

ANALYSIS OF THE DELHI BIRD COUNTS - JAN.1981 TO AUG.1987

(Based on data collected by 'KALPAVRIKSH')

PART 1

THE AREAS AND THEIR BIRDS

Compiled and analysed by

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## PREFACE

This analysis is based on the data collected during the biannual counts conducted under the auspices of the environmental action group, Kalpavriksh, between Jan '81 and Aug '87. The entire credit for the data collected during these counts is that of the participants of these counts, individually and collectively. Of all the participants, Ashish Kothari has been the person most responsible for the continuance of these counts to the present. Individual mention of the remaining participants is not feasible but this in no way detracts from the important role they have played in keeping track of Delhi's birds.

The views expressed in this report are, however, solely those of the authors, and do not necessarily represent those of other members of the group. Many of the concepts dealt with in this report are controversial, as must be when dealing with such an inexact science. Any lapses on our part may, however, please be excused.

New Delhi,  
October 1987.

The Authors



#### ACKNOWLEDGEMENTS

The advice and help given by Ashish Kothari in reading over the incomplete manuscript, and suggesting valuable alterations and improvements in the text and tables is gratefully acknowledged.

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SECTION A

An Introduction to the Delhi Bird Counts.



Note - Names of all persons who have  
participated in the bird counts should be

Put on the THE DELHI BIRD-COUNTS - JAN. 1981 TO AUG. 1987.

#### INTRODUCTION.

During the nineteen seventies, Delhi experienced an unprecedented increase in its population, construction of buildings, both for official and residential purposes, and creation of parks for the convenience of the City's inhabitants. All this led to the destruction of vast areas of wilderness, in and around Delhi, along with the inevitable decimation of the wild inhabitants of these areas, namely the birds and other small creatures. Halting this, all too often, unwise destruction of Delhi's prime wilderness areas, was, clearly, not easy. None-the-less, many members of the environmental group, Kalpavriksh, felt that something must be done to document the wealth of these doomed areas before it was too late, to follow-up fluctuations in numbers of the birds of these regions, increase the general awareness of the populace regarding the irreplaceable losses involved in narrow-minded development of Delhi, and, eventually collect enough documentation and support to establish a strong case to preserve the more important wilderness areas. Hence grew the idea of an actual survey of the birds inhabiting the more important wilderness areas, and in order to provide a balanced picture, also of the stable man-made habitats, namely parks and gardens.

#### METHODOLOGY.

Before the counts could be conducted, many factors had to be considered. The following is a summary of the more important ones :

i) What is exactly meant by counting the birds? Do we need to count all the birds of the areas under study ?

No, thank God ! It would clearly be impossible to count all the birds in even a small area with accuracy, unless the birds are physically caught, and others prevented from entering the area at the same time. This, is, of course, impracticable, and, fortunately, is not needed either.

What we required for our purpose of documenting the changes in the numbers of birds in succeeding counts was not the absolute numbers of birds in the sample area, but a comparison of the numbers seen in succeeding counts. This meant that this comparison would be valid provided as many variables as possible could be kept constant over the succeeding counts, so that the error in counting, however great, would remain constant, and thereby get negated when a series of count results were compared.

The problem of counting the birds, then, reduces itself to one of counting them in such a way that as many variables as possible are kept constant. To this end, the following measures were taken : (a) In each of the areas chosen, a route to be followed in each count was decided upon beforehand. Route-maps were to be provided to each group, with instructions of not to deviate from the prescribed route at any time. This ensured that the same area of the region was surveyed in each successive count. (b) All the counts were to begin at the same time in the

Ridge at 2 AM

morning, viz. 7 am. in the summers, and 7.30 am in the winters. An approximate amount of time in which the count should be completed was provided, though following this religiously was not always feasible, due to the varying numbers of birds, and occasional difficult-to-identify species encountered. (c) The numbers of participants in each group surveying an area, was 4 to 6, with a minimum of one person among them being a reliable bird-watcher. (d) The counts were held at approximately the same date in each season annually, and postponed if weather conditions would lead to an abnormal result, eg. if there was rain on the proposed count-day. (e) Sheets with the bird species given alphabetically were provided in standardized form, so that the method of recording the sightings would be constant in the different areas, and in successive counts.

ii) What areas should be included in the counts ?

Delhi is known to have three main habitat areas; the water-related habitats, ridge habitats, and man-made habitats of gardens, parks and buildings. Clearly, in order to include the most representative sample of Delhi's birds, areas representing all the three habitat areas would have to be included in the counts. In addition to this, the area should be known to at least one member of the group, so that it could be adequately surveyed; it should be easily accessible, and should remain unchanged for at least a reasonable period of time.

With this in mind, a total of 11 areas were included in the counts. These were (a) the Jamuna in two areas, one near the ISBT and the other near Rajghat, representing the water habitat, (b) the Ridge in three places (in Old Delhi, New Delhi, and Rajendra Nagar areas), and the J.N.U. wilderness areas, representing the Delhi Ridge habitat, (c) Lodhi Gardens, Deer Park, and Jahanpana, representing the man-made habitats and (d) the Zoo and Kushak Nala, representing a mixed water and man-made garden habitat.

iii) How often should the counts be done ?

Well, theoretically, the oftener the better ! But, taking considerations of available man/woman-power, and number of willing well-informed bird-watchers into account, it was decided to limit the counts to twice a year; once in the monsoons (to check on the resident avifauna), and once in the winters, to count the birds that come to Delhi to winter. The intermediate periods of migration were purposely avoided, as our aim was to establish the status of birds that depend on the habitats of Delhi for sustenance during the whole year, or during part of it, and not to concentrate on passage migrants, whose true fate lies in the prevailing conditions elsewhere.

#### DATA BASE.

To date, the counts have been performed biannually for 7 years. Altogether, 83 separate area-counts have been performed, the results of which are available at the time of this analysis. (Many more have actually been performed, but the results of those counts are unavailable, and will not be considered again in this discussion.) This obviously means that the records of some areas where the counts were held are not complete. Infact, of the 11 areas where the counts were performed



initially, only 6 areas have records of 9 or more counts. These are the Deer Park, ISBT/Jamuna, JNU, Lodhi Gardens, Rajghat/Jamuna, and the Zoo.

COUNTS DONE (Jan.1981 to Aug.1987) for which data is available.  
Number of seasons in which counts have been done till now are 14.

	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87
D'Park (9)	*	*			*	*	*		*		*		*	*
ISBT (12)	*	*	*	*	*	*	*	*	*	*	*		*	*
J'Pana (6)			*	*	*	*	*							*
JNU (9)	*	*	*	*	*	*	*	*						*
K'Nala (6)	*		*		*	*	*							*
L'Gard(11)	*	*	*	*	*	*	*			*	*		*	*
Rajghat (12)			*	*	*	*	*	*	*	*	*	*	*	*
RNRidge (6)	*		*	*	*	*	*							*
ODRidge (1)														*
APSRidge (1)														*
Zoo (11)	*	*	*		*	*		*	*	*		*	*	*

- i) Abbreviations used : \*..Count done; (Number)..Number of counts  
D'..Deer; J'..Jahan; K'..Kushak; L'..Lodhi; R'..Raj; RN..Rajendra Nagar; OD..Old Delhi; APS..Army Public School.
- ii) Counts in ODRidge & Jahanpana were conducted regularly, but results are not available for analysis.

The above counts, spanning 7 years, account for 83 separate counts conducted in the 11 areas noted. A total of 242 hours were spent in actual counting of the birds, and nearly 100 people participated in them at one time or the other, though the 'regulars' were only a handful.

Clearly, though the data-base has expanded greatly over the years, there are only 5 areas where the counts have been conducted with any degree of regularity. These are the Deer Park, ISBT/Jamuna, Lodhi Gardens, Rajghat/Jamuna, and the Zoo. Most of the remaining areas were dropped due to the area-coordinator shifting away, or loosing interest. As noted, in some areas the count results were unavailable for analysis at this time. A pity ! This resulted primarily due to a delay in the collection / consolidation of the data, and subsequent misplacement of the original count data. This only highlights the need for regular consolidation of collected data, and an effort on the part of the overall coordinator to ensure that all reports are received in time, and kept safely.

#### METHOD OF ANALYSIS

Due to the huge amount of raw data collected during the preceding counts, analysis by computer was elected.

i) First, a list of all the birds seen in our counts was made, and arranged in alphabetical order.

ii) Next, each bird species seen was assigned a code number representing its preferred habitat, preferred nesting-site, and preferred primary and associated foods. This



information was collected from Salim Ali's 'Book of Indian Birds', and other books, when needed. This coding system would greatly increase the utility of the data collected, and allow inferences not possible by other means. Of course, in order to give each species a definite preferred habitat, nesting site, and food eaten, was, to some extent, arbitrary, and flavoured by the authors' own experiences. Differences of opinion as to the most suitable category in which to place the species could, therefore, rightfully arise, but this must be accepted as unavoidable. (Appendix 1 lists the key to the various habitats, nesting sites, and foods. )

iii) The raw count data from each area was then filled into these standardised work-sheets, in the respective columns for each subsequent count, which were arranged in chronological order, from the 1st (winter 81 ), to the last (monsoon '87), count. These, then, formed the data-base on which all the subsequent analysis was performed.

iv) In each area-sheet, totals of each species sighted in winter, monsoon, and overall, with the ratio of numbers seen in the winters verses the monsoons (ie. winter/monsoon ratio), and in areas where sufficient counts had been performed, the temporal trends of the various species, were assessed. The totals of the water, land and birds-of-prey, (both the numbers and species), were computed as well.

v) Next, all this data was scrutinised in order to determine a vast amount of information, and a written report prepared for each area. Among some of the information so obtained was the following :

a) A statement regarding the numbers of species in the area, their relative abundance in the two seasons, and the actual numbers of birds of the various species seen;

b) The most numerous species, with an assessment of the habitats of these birds, and the variations in the numbers of each species in the two seasons, ie. an estimate of their relative prevalence in the winter verses the monsoons;

c) The changing numbers of each species, with an indepth analysis of the habitats, nesting, diet, and seasonal prevalence of those species that showed a negative trend, with a view of establishing the cause for their decline;

d) An assessment of the important habitats, nesting sites, and foods of the species seen in each area, etc.

vi) Once this data was collected for each of the 10 areas, consolidated lists of all the relevant areas were made to provide an overall picture of the bird-species in Delhi, by a process of analysis similar to that given above. Thus, data about the numbers of each species, their seasonal status, and their temporal trends, as related to Delhi as a whole, was obtained. The habitats, nesting areas, and foods of Delhi's birds were also be determined, with special attention to species that appeared to be decreasing in most of the areas where they were seen.

#### ADDENDUM

All this information has provided probably the first documented analysis based on the sightings of nearly 50,000 birds in 83 separate counts, spread over 7 years, and including 10 areas of varying habitats in Delhi. It is to be hoped that in addition to the knowledge gained about the avian residents of each area, and the individual bird species themselves, this analysis will provide a definite base-line of information that can be used for comparison with future counts or other ornithological work in this region.

It can also only be hoped that the Delhi counts are continued for many years to come, and that the results of this analysis can be confirmed, or negated, by the data obtained from future counts. If similar counts are adopted in other areas of this country too, a valuable set of documented information will be produced, in addition to providing a useful outlet for the energies of the numerous bird-watchers of India.

SECTION B

Consolidated Analysis of the Bird Counts.



CONSOLIDATED ANALYSIS OF THE DELHI BIRD-COUNT  
(JAN. '81 TO AUG. '87.)

Following the analysis of individual areas, 8 of which had enough count-data to provide at least some degree of meaningful analysis, the data of all these areas was pooled together with the help of a computer to provide a comparison between the various areas, and to draw an overall picture applicable to the whole of Delhi. The Tables of the sightings of birds during the counts are also provided at the end of this chapter, and the reader is invited to refer to these frequently as he reads through the text.

The eight areas whose count data has been consolidated here are : Deer Park, ISBT/Jamuna, Jawaharlal Nehru University, Kushak Nala, Lodhi Gardens, Rajendra Nagar Ridge, Rajghat/Jamuna and the National Zoo. An analysis of each of the individual areas is given in the later part of this volume, but first the results of the consolidated data are presented here.

THE BIRDS OF DELHI.

In all the areas whose count data was consolidated for this part of the report, a total of 177 species of birds were identified. Of these, 105 species were land-birds, 15 birds-of-prey, and 57 water-birds. The Warblers, some Wren-warblers, Terns, and some Gulls, were grouped together due to the difficulty in reliable field identification of different species of these groups, and, it may, therefore, be reasonably presumed that if sightings of individual species of these groups are accepted as accurate, several more species would have been documented.

Looking now at Table 1, 'Totals of Birds Seen', note that the numbers of species seen in the winter and monsoon was nearly equal for both the land-birds (with 95 species being seen in winter and 94 species in the monsoons), and for the birds of prey (12 verses 13 respectively). The number of species seen was, however, clearly greater in the winter for the water-birds, with 49 species being seen in winter, verses 37 in the monsoons. Overall, 156 species were seen during the winter counts, and 144 during the monsoon ones. In individual counts too, a slightly greater number of species were seen in the winter, with an average of 91 species (range 74 to 118) identified altogether in each winter count, and an average of 88 species (range 101 to 68), in the monsoon ones. This means that though the average number of species seen during each count in both seasons is approximately equal, yet overall there is a greater variety of bird species to be seen in the winters.

THE NUMBERS OF BIRDS OF DELHI.

The first Table also gives us the total number of birds seen in individual counts, in the winter and monsoon counts, and overall. Note that a grand total of 47,977 birds were counted in the 8 areas whose results were consolidated here ! Of these,



27,231 (56% of the total), were seen in the 38 area-counts in winter, and 20,754 (44% of the total) in the same number of counts in the monsoons. However, scrutinising these figures more closely, it is seen that the greater numbers of birds seen in the winter is entirely due to the water birds, where 12,269 were seen in the winter, verses a mere 3487 in the monsoon, a difference of 350% ! On the other hand, land birds are actually more numerous in the monsoon, with the respective figures being 13,710 & 16,005 (winter verses monsoon). Lastly, birds of prey were seen in almost equal numbers in both seasons, with 1,286 of them being seen in winter, and 1,262 being seen in the monsoon. Interestingly, therefore, Delhi provides the wintering ground for a large number of water birds, and hence their greatly increased numbers in the winter. Land birds, on the contrary, being more numerous in the monsoons (notwithstanding the winter migrants that come here), do not appear to use Delhi as an important wintering ground. This fact is supported by the small numbers of individual species of land migrants seen in these counts, a fact that is apparent later on in this analysis.

But what of the most numerous species in Delhi ? The next table ('Numbers of Birds Seen', Table 2) attempts to shed light on this aspect.

Seen here is the fact, that among the 6 commonest birds, the Blue Rock Pigeon, Common Myna, House Crow and Sparrow, are not unexpectedly, present. The House Sparrow, though recorded as being less numerous than the Redvented Bulbul, has often not been counted wilfully, so that it has, in general, been greatly under-recorded. Hence it is, without-a-doubt, in reality more numerous than the Bulbul. Included in the 10 most numerous, are also the RoseRinged Parakeet, and Pariah Kite. All the remaining birds in the first 10, are water-birds; the Pintail and Shoveller Ducks (2nd & 4th most numerous), and the Gulls of all species (the latter comprised essentially of the Black headed and Brown Headed species).

Of note also, is the fact that the 10 most numerous species (6% of the total number of species), account for 21,709 birds (46% of all the birds seen), while the 17 commonest (10% of all the species), account for 28,956 or 62% of them.

59 species were seen in numbers of 20 or less in total during all the counts together, and can, therefore be stated without hesitation, to be rare in Delhi. These, then account for nearly a third of the species spotted. Another 51 species (29%) were seen in numbers of 100 or less in all the 75 area-counts; these can be stated to be uncommon in Delhi, and include birds such as the Redstart, Golden Oriole, Indian Moorhen, and the Crow-pheasant. In all, then, 62% of Delhi's birds are rare or uncommon, and therefore even a moderate decrease in their numbers could lead to a deleterious effect on their populations in this region.

Also of note, though not surprising, is that all the most numerous land birds, (except for the Redvented Bulbul and the Rose Ringed Parakeet both of which belong to the man-made garden habitats in Delhi, ie. C15), are commensal with humans (ie. habitat C18).. Among the water birds, the Gulls are also commensal. Thus, of this group, only the Shoveller and Pintail



ducks are normally independent of humans and the habitats engineered by them.

#### SEASONAL STATUS OF DELHI'S BIRDS.

In the 75 area-counts that have been consolidated for this part of the analysis, 38 area-counts were in winter, and 37 in the monsoon. As seen in the introduction to this volume, the numbers of counts held in the two seasons in each individual area was not always equal, leading to difficulty in determining the seasonal prevalence of the species seen in that area. With the pooling together of all the area-counts, however, the number of counts performed in the two seasons are similar, as noted above. Hence, in the case of this pooled data, the ratio of the numbers of birds seen in the winter counts, to the numbers seen in the monsoon counts (Wn/Mo ratio), can safely be taken to represent accurately the seasonal status of the various species of birds that have been spotted during these counts.

With this introduction, turn now to the 3rd table, 'Seasonal Status of Birds Seen'. In this table, the birds have been arranged according to their Wn/Mo ratio, with those with all birds of that species seen in the monsoon (symbolically stated as 'All Mo'), placed at the top of the table, and those with an increasing number of sightings in winter placed in order below these, till the species with all their sightings in the winter are reached (symbolically stated in this table as 'All Wn').

Further, it is proposed in this analysis, that species with a Wn/Mo ratio of  $<0.3$ , (ie. those species that are 5 times commoner in the monsoons), be called monsoon migrants; those with a ratio of  $<0.6$  (ie. 2ce as common in the monsoons), be called predominant in the monsoons;  $>1.9$  (ie 2ce as common in the winter, predominant in the winter;  $>4.9$ , (ie. 5 times commoner in the winter), winter migrants; and species with a ratio of 0.6 to 1.9, similarly present in both seasons. This classification of seasonal status will be used in the following discussion.

In order to avoid confusion, whenever discussing species known to be migrant to India from the Himalayas and further north, the phrase 'known winter migrant' will be prefixed. The remaining birds that appear to be winter migrants to Delhi, are, therefore, only locally migrant to this region.

Overall, 63 species of birds have a Wn/Mn ratio of 0.5 or less. Of these, 32 species have a Wn/Mo ratio of 0.2 or less, thereby fulfilling the criteria of monsoon migrants. Among these, the Golden Oriole, Night Heron, Pheasant Tailed Jacana, Streaked Weaver, Black Headed Munia, all the Cuckoos (Pied Crested, Indian Hawk, Koel, and Plaintive), the Barbets (Green and Coppersmith), Mahratta Woodpecker and the Black Partridge, appear to be monsoon migrants. The remaining species, while fulfilling the criteria for monsoon migrants, have not been included as such, because their sightings are too few, or the numbers recorded appear too inconsistent with the remaining sightings of that species to be reliable.

31 species of the 63 mentioned above, show a monsoon predominance. Out of these, 9 are water birds, including the



Little and Cattle Egrets, Ringed Plover, Purple and Pond Herons, Cormorant, Indian Moorhen and the White Breasted Waterhen. Among the land birds are included the Black Drongo, the Spotted, Red Turtle and Ringed Doves, White Cheeked Bulbuls, and the Little Green Bee Eater.

Birds that should be considered separately, are the known winter migrants that are recorded in these counts as being predominant in the monsoons. These include the Rosy Pastor, a bird that has been seen entirely in the monsoons. This is, clearly consistent with its known status as a passage migrant through Delhi. Also in this group are the Spotted and Green Sandpipers, and the Redshank. This seeming paradox can be explained on the basis of the birds sighted being stragglers from among last years migrants, or more likely, by considering them to be early migrants of the present year.

Moving on to the birds which are known winter migrants from abroad, we note that, apart from the Warblers, there are 40 such species. of these, 33 (83% of the total species of the known winter migrants), are birds either living in water (eg. the Ducks), or closely related to it (eg. the Wagtails). Among these, the most numerous are the birds that are usually found in water - the Pintail, Shoveller, Common Teal, and the Gulls. These were seen in numbers of over 3,000 birds for the first, more than 2000 for the second, and over 1000 for the remaining two. The large numbers of Gulls is more convincing when we remember that only two species visit Delhi in large numbers; the Black Headed and Brown Headed gulls. Besides these very numerous migrants, known winter migrants among the water birds numbering more than 100 birds included the Brahmini Duck, and Little Stint.

On the other hand, among the land birds too, it is the birds related to the water habitat that take pride of place as regards their numbers. Witness the fact that among the most numerous known winter migrants among the land birds, four are related to the water habitat (A10 habitat,, ie. open spaces in the vicinity of water). These are the White and Grey Wagtails, Common Swallow, and Bluethroat. On the other hand, of those migrants not related to water, only the Redstart is among the 5 most numerous. Of the remaining known land migrants, the Red Breasted Flycatcher is fairly common, while the Grey Headed Flycatcher, Kestrel and Pale Harrier are distinctly rare.

Among the birds that are not known winter migrants, yet seen >5 times more commonly in the winter counts as compared to the monsoon ones, (ie. birds that are locally migrant to Delhi in the winters), the Pied Wagtail, Grey Shrike, Painted Stork and Wood Shrike stand out, with Wn/Mo ratios of 6.3, 6.2, 7.3, and 7.3 respectively. The Black Winged Stilt, being both a resident and locally migrant bird, is also much more numerous in the winters. Several other species have not been included in this group as their sightings were insufficient or inconsistent.

Birds that are predominant in the winter include also the Warblers, Large Grey Babbler, Magpie Robin, Blossom Headed and Alexandrian Parakeets, and the Dabchick. As above, those species in which there is doubt about their status, are omitted.

Apart from the birds seen solely, or more frequently in one of two seasons, Delhi has a large number of birds that

can be seen the year round. The most numerous amongst these are the Blue Rock Pigeon, Common Myna, House Crow and Sparrow, Redvented Bulbul, Rose Ringed Parakeet, Red Wattled Lapwing, and the Spotbill Duck. Apart from the fact that these birds are present throughout the year, and so are visible in both the winter and monsoon counts, thus partly accounting for their large numbers, what is obvious is that, barring the last two named, the other birds are the ones that have adapted themselves to man's ongoing onslaught on their natural habitats. Of interest also, is that the Spotbill is the only species amongst the more numerous birds seen in similar numbers year round, that belongs to a water habitat.

Among the other familiar birds that are seen year round are the Mynas (Pied, Brahmini and Bank), Kingfishers (Pied and White Breasted), Hoopoe, Babblers (Large Grey, Common and Yellow Eyed), and Indian Robin. Among the Shrikes, only the Rufous Backed, and among the Munias, the White Throated and the Red, were seen frequently in both seasons.

#### HABITATS, NESTING AND FOOD REQUIREMENTS OF DELHI'S BIRDS.

In this section we will try to analyse the habitat, nesting and food requirements of Delhi's birds. As stated in the introduction, this analysis is assisted by giving a number for each of these three. The key for the numbers and the headings for each column, are provided in Appendices 1 and 2, and the reader is advised to refer to these frequently. In general, each bird has been assigned a number for its most frequented habitat, nesting place, and main and associated foods. Obviously each bird can adapt to more than one of these, but it is assumed that, given a choice, the bird will choose the assigned habitat/nesting place/ foods. Again, as a corollary, decreasing the availability of any of these is likely to result in a change in the birds prevalence, unless the species is able to adapt to the change as rapidly as it occurs.

Does this mean that if the particular habitat is absent from the area under study, species assigned to that habitat will never be seen there? No, of course not! Most birds are adaptable and are at times seen far away from the habitat they prefer. But there is no doubt that they will be seen in numbers often far less than they would in habitats of their preference. This statement does not, however, hold for very adaptable species, eg. the House Crow, or for birds that do not adapt well at all, eg. the Jacanas. However, these birds are the exception rather than the rule, so our method of analysis, although not perfect, is acceptable.

#### Habitats of Delhi's Birds.

Of the 177 species recorded in the 8 areas analysed (see Table 4, 'The Habitats Of The Birds'), 71 species belong to the water habitat (A1 to A10). The two species of Gulls, though commensal with humans (habitat C18), should also be included in this group; of the remaining species seen in the counts, 67 species belong to the ridge habitats (B11 to B14), while the



remaining 39 species seen, are found in habitats related to humans (C15 to C18). It is striking to note the average number of birds that can be seen in each habitat: water habitat 250 birds per species, garden/monuments - 200, ridge habitats -150, and commensals - 1,450 birds per species. If the garden habitat is more lucrative for birds than the ridge habitat, then, one may rightfully ask, why not convert all the ridge in Delhi into a vast garden?

The reason is simple; the birds seen in large numbers in the garden habitat are the ones that have been able to adapt to changes in their own natural habitats to an extent that they have thrived in the Delhi area in habitats engineered by humans. Of these there are relatively few species - 38% of the total land-species. Most of the remaining 66 species have not been able to adapt well, and would be decimated if the ridge habitat were to be destroyed.

Among the habitats related to water, A1 and A2 (Open water, and water interspersed with reeds), represent the habitats frequented by the migrant and resident Ducks, and consequently have large numbers of birds associated with them (2545 and 5769 respectively, for each habitat). Habitats A5 (shallow sloping shore), and A10 (open spaces close to water), are also very populous, with 17 species seen in each of the two habitats. Included in the former are most of the waders, the Purple and Grey Herons, Painted and Black Necked Storks, and the Rosy Pelicans. However, none of these birds is very numerous, with the Painted Stork (363 birds seen), and Black Winged Stilt (274 birds), being seen most frequently. On the other hand, habitat A10, though having the same number of species, harbours 4 times the numbers of individual birds, the most numerous being the Red Wattled Lapwing, Pied Myna and the Starling (1347, 1175, 461 birds, respectively, of each species).

All the remaining 6 water habitats harbour 23 species, totalling nearly 3000 birds. These will not be dealt with individually here due to space limitations.

Moving on to the ridge related habitats (B11 - thorn, scrub, and grass jungle; B12 - dry, rocky, with bushes and occasional trees; B13 - short trees with bushy undergrowth; and B14 - open areas, with possible cultivation, and occasional trees), it is seen that the numbers of species are nearly equally distributed between the latter three - 23, 20, and 22. The numbers of birds are the maximum for the B14 habitat, next in the B12 habitat, and least in the B13 habitat.

As to the man-made habitats, the garden habitat with few trees, and small bushes (C15), is very well populated, with 5364 birds of 14 species counted. These include the Redvented Bulbul, Rose Ringed Parakeet, and the Hoopoe. Habitat C16, also a garden habitat, but one with groves of trees, is much less populated, with only 517 birds of 9 species seen here, among them the Grey Hornbill, Golden Backed Woodpecker and the Golden Oriole. This paucity of birds may be related to the fact that these birds are very particular to groves of tall trees, of which there are few in Delhi, and especially in the areas counted. The commensals have done, not surprisingly, the best among all the birds, with 14,539 birds of 10 species being counted, and this



too, almost certainly is an underestimate.

Finally, it would be pertinent to make an interesting observation about the numbers of individuals and species seen in the three types of habitats in relation to the two seasons. In the water habitat, nearly thrice the number of birds were seen in the winter counts as in the monsoon ones (12,490 verses 4,390, respectively). These represented 56 species in the winter and 53 in the monsoons. On the other hand, in the case of the ridge habitat; many more birds were seen in the monsoons (6,178 of 61 species verses 4,155 birds of 59 species in the winter). Lastly, in the habitats related to humans, the numbers of birds seen in the two seasons were remarkably similar (10,619 of 36 species in winter, verses 10, 187 of 31 species in the monsoons).

#### Nesting Habits Of Delhi's Birds.

In this section we will analyse the breeding habits of the birds sighted in the Delhi Counts. At the outset, it may be stated that 41 species of birds are winter migrants from abroad to this area, and do not breed here. An additional 4 species/group of species has variable breeding habits (ie. Warblers (all), Terns, Black Winged Stilt and Wren Warblers, Others). None of these species concern us in this section, and will not be mentioned further.

Of the remaining 132 species with nesting potential in Delhi, 38 species nest in sites related to water, and 94 species in land related sites, of which 14 breed in buildings and other structures made by humans. Taking the numbers of these birds into account, the vast majority breed in land related sites, (18,669 such birds having been counted so far); another 9,718 potential breeders in man-made structures, and only 6,860 birds in water related sites.

Of the water related sites A3 (trees in close proximity to water), provides breeding for the maximum number of species of water birds - 15. Included among these are well known breeders in the Delhi area, such as the Night Heron, Little and Cattle Egret, Nakta and Cormorant. Breeding of the White Ibis, Black Necked Stork and the Cotton Teal is unlikely, as they are very rare in this area. Other important breeding sites are A2 (water interspersed with reeds), A4 (dry banks of rivers), and A5 (vertical river banks). 6 to 7 species are known to breed in each one of these sites. The Red Wattled and Yellow Wattled Lapwings are exceptional among the water birds, in that they breed in waste-lands, often remote from water.

But without a doubt, the most important breeding sites in Delhi as far as the numbers of birds is concerned, are land related; thorny bushes (B9), low trees (B10), and tall trees (B11). These sites account for 66 species, or nearly half of the potential breeders. Of these 17 species breed in thorny bushes; vegetation all too often destroyed during the conversion of ridge type habitat into parks and gardens. Fortunately, birds breeding in trees are often seen to breed in gardens made by humans too; eg. Doves, Sunbirds, Shrikes and Bulbuls. However, the birds in greatest danger from the destruction of tall trees growing in the wilderness areas are the birds-of-prey; for example, the White

Eyed Buzzard, Shikra, Black Winged Kite and Tawny Eagle. The other important nesting area, B12 (buildings and other monuments made by humans), provides building sites for 14 species of birds, included among which are the ubiquitous House Sparrow, Blue Rock Pigeon and Common Myna. Others, such as the Barn Owl, the resident Swallows, and Pied Wagtails cannot tolerate human interference as well and are, therefore, not commonly seen breeding in Delhi.

#### Dietary Habits Of Delhi's Birds

From Table 5 it can be seen that fully 74 species of birds eat insects (diet #1), as their primary diet. Among these, more than half eat nothing else. Another 15 species consume water insects and small water animals (diet #2) as their primary diet. Fish, frogs, etc (diet #3), forms the staple diet for 18 species, while small mammals and birds (diet #4) is consumed by all the birds of prey except the Black Winged Kite, Tawny Eagle and Vultures, the latter two surviving primarily on carrion (diet #5). Thus it is seen that 119 species (68%), consume primarily an animal diet. In terms of numbers of birds, however, this group includes only 20,980 individuals, or 43% of the total birds seen.

Of the remaining birds, vegetarian diets are consumed by 18,248 birds of 51 species, (ie. 29% of the species consume this diet, yet they represent 38% of the total numbers of birds sighted). Lastly, offal is consumed by 8,782 birds of 7 species or, 4% of the total species seen, and represent 18% of the total number of individual birds seen. Clearly then, though the birds consuming animal diets are of a great many species, yet their numbers are relatively less than the vegetarians, and far less than the scavengers. This interesting fact is true for both birds consuming water vegetation as well as those subsisting on land vegetation.

Examining the vegetarian diets more closely, it is seen that grass seeds (diet #7), is eaten by the maximum number of species (16), but they number only 2,683. On the other hand, grains and crops were eaten by 7,487 birds of only 7 species; of these, the Pigeon and House Sparrow accounted for 5,276 birds. Also eaten by large numbers of birds is water vegetation, this being consumed by 4,828 birds of ten species, including Pintails, Spotbills, and Brahminy Ducks. Other diets (#8 - shoots and roots, #10 - flower nectar, #11 - fruits), are eaten by relatively few birds and will not be discussed in detail here.

One last fact that should be noted, is that birds consuming all three water related diets ( #s 2, 3 and 6) are at least twice as common in the winters as in the monsoons. Those eating the vegetarian diets unrelated to man ( #s 7, 8, 9 and 10), are commoner in the monsoons in a ratio of 1 : 0.65, the frugivorous birds (consuming diet #11), are slightly more numerous in the winter; while birds consuming crops and seeds and offal (diets 12 and 13), are equally distributed in the two seasons.



## THE STATUS OF DELHI'S BIRDS.

In the final section of this analysis, an attempt is made to determine the temporal trends shown by the birds seen in these counts. In order to determine this, the trends shown by the species in each of five areas (Deer Park, ISBT/Jamuna, Lodhi Gardens, Rajghat/Jamuna, and the Zoo) have been consolidated in the table 'Species Trends in various areas of Delhi' (Table 6). After comparison of the individual species' trends in all 5 areas, the overall trend in Delhi is arrived at, if deemed possible. Only the 5 areas mentioned have been considered in this consolidated table, as it was only in these areas that there have been sufficient uninterrupted counts to allow conclusions regarding any changes in the numbers of birds spotted over the preceeding seven years to the present.

As to the actual method of recording the changes in numbers, the numbers of each species spotted in successive counts of each area were scrutinized and the inferences recorded as one of seven possibilities - \*, sightings too few for inferences to be drawn; -1, a probable decrease in numbers; -2, a definite decrease in numbers; 1, a probable increase in numbers; 2, a definite increase in numbers; \*0, fluctuating numbers but no definite change. Lastly, if the recordings were known to be haphazard, for example in the case of the House Sparrow and Crow 'Inacc' was entered in the 'Trends' column. After the trends of the various species in each individual area had been determined in this way, the results obtained in all the five areas were consolidated by computer, and then further analysis attempted, as mentioned earlier. (See page 4).

In Table 7, 'Overall Trends Of Delhi's Birds', the bird species are arranged according to their temporal trends as defined above. From this table it can be seen that of the 163 species seen in the five areas for this part of the analysis, 82 species were seen too infrequently in the individual areas to provide any definite overall trends. 37 species had different trends in the various areas and hence no definite trends were discernible overall. Yet another 6 species could not be analysed due to probable inaccuracies in the recording of the species. Of the remaining 38 species, there was no change in the numbers of 14 species. This group includes the Hoopoe, Little Brown and Ringed Doves, Redvented Bulbul, Rose Ringed Parakeet and Pond Heron. Six species appear to show that their numbers are probably increasing. These are the Blue Rock Pigeon, Common Myna, Black Winged Stilt, Spotbill, Cattle Egret, and the Red Wattled Lapwing. Significantly, none of the species could be definitely said to be increasing. The remaining eighteen species showed an overall probable, or definite decrease in their numbers and it is probably safe to say that this trend is representative of these species in the major part of metropolitan Delhi.

Although the group of birds that appear to be increasing will not be dealt with in detail, it is apparent that only two land birds (Blue Rock Pigeon and Common Myna), are included in this group. The remaining four are all water birds. Of these the increasing number of Spotbills is especially



heartening, its success being largely due to its successful colonization of the Zoo's ponds. The remaining three birds are quick to congregate at newly formed bodies of water, eg. seasonal ponds. In addition, both the Red Wattled Lapwing and the Cattle Egret are less dependent on water than most typical water birds, and hence can probably thrive in spite of the continuing drainage of water bodies in and around Delhi.

Let us now examine the group of threatened birds in greater detail. As seen from Table 8a, 'Threatened Birds Of Delhi', 8 of the 18 threatened species have shown a definite decrease in their numbers over the last seven years. These are the Black Drongo, Marsh Harrier, Pheasant Tailed Jacana, Redstart, Indian Robin, Stone Curlew, and Warblers (all). (The latter, Warblers, are of course, not one species at all, but will be treated as such in the following discussion for convenience.) The remaining ten species showed a probable decrease, and include the White Cheeked Bulbul, Brahminy Duck, Tufted Pochard, Shoveller, Grey Heron, White Breasted Kingfisher, Bay Backed Shrike, Purple Sunbird, and the White Wagtail.

As to the habitat preferences of these species it is seen in Table 8b, 'Habitats Of The Threatened Birds', that ten of the species belong to the water habitat and six to the ridge habitat. Only 2, (the Redstart and Purple Sunbird), belong to man-made habitats; of the latter it is prudent to remember that the Redstart is a migrant, and its cause of decline may well lie outside the Delhi area.

Considering now the nesting sites of the threatened birds (Table 8c, 'Nesting Sites Of The Threatened Birds Of Delhi'), it is seen that 7 of the 18 species are known winter migrants and do not breed in Delhi. These then, will not be considered further in this section. Of the remaining, five species breed in water related (A1 to A5) sites, and 6 in land related ones (B7 to B12). Interestingly, none breed in sites directly related to humans, that is, in buildings and monuments (site B12). Among the water related sites, two species prefer the A3 site (trees in close proximity to water), while one species breeds in each of sites A1 (floating nests in water), A4 (Dry banks of rivers), and A5 (vertical river banks). In the case of birds preferring land related sites, four threatened species breed in low trees (B10), and one each in dry scrub country (site B7) and in tall trees (site B11). Therefore, the only general statement that can be made about the breeding sites of the threatened birds, is that most breed on trees close to, or remote from water, while none breed in sites related directly to humans.

What are the dietary requirements of these birds. Looking at the Table 8d, 'The Dietary Requirements Of The Threatened Birds', it is seen that 8 species eat only or primarily, insects (diet #1). Another four species eat fish, frogs etc (Diet #3). Among the remaining four species, 2 consume water vegetation (diet #6), and 1 each consumes water insects (diet #2), small animals and birds (diet #4), berries and figs (diet #9) and flower nectar (diet #10). For whatever it is worth, it is interesting to note that except for the Grey Heron and Painted Stork, all the other threatened sixteen species eat water or land insects, as a primary or associated part of their

diet.

Finally, considering the seasonal status of this group of birds, (not given as a table), we see that seven species are known winter migrants to Delhi, including the Brahminy and Shoveller Ducks, Tufted Pochard, Redstart, White Wagtail, Marsh Harrier, and some of the Warblers. The Painted Stork is locally migrant to Delhi in winter. Only one species, the Pheasant Tailed Jacana is migrant to Delhi in the monsoon, though three other species (Black Drongo, White Cheeked Bulbul, and the Bay Backed Shrike), are predominantly seen in the monsoons. The remaining 6 species including the Indian Robin, White Breasted Kingfisher, and Grey Heron, are found in fairly constant numbers throughout the year.

#### EPILOGUE.

Having completed the discussion about the data acquired during the Delhi bird counts, and inferences derived therefrom, it only remains to be stated that these results are clearly empirical. They can only form a basis for directing field studies in the areas where the counts have been performed and cannot be taken to be gospel by themselves.

The most controversial aspect of this analysis is, undoubtedly, the attempt to determine the changes in the prevalence (the trends) of the various bird species. Even in cases where a decrease in numbers noted is real, it must be kept in mind that many bird species have a natural cycle lasting a number of years (the exact time period differing according to the species), in which they show a period of decreasing numbers, followed by a spontaneous recovery, till their initial numbers are reached again. The cause of this phenomenon is unknown, though it may be related to food supply. To us it means that an increase or decrease in the numbers of a species may be part of a natural cycle and not, in fact, have anything to do with human bunglings. The truth can, unfortunately, be determined only after following-up counts for a couple of decades or more; and at the end of that analysis, if one finds that the decrease was in fact real, it may be too late. So, let us give the threatened species the benefit of the doubt, and accept any decrease in numbers to be real and remediable, till information to the contrary is made available.



Table 1. THE TOTALS OF BIRDS SEEN IN THE DELHI BIRD COUNTS.

	Win, Mon Ratio Total																	
	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	#'s	#'s	Wn/Mo	#'s
Time per Count (Hours):	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	116.6	107.6	1.1	224.2
Persons Participating :	15	24	36	19	31	26	19	8	14	12	13	8	16	30	147	127	1.2	274
# Of Counts / Season :	4	6	7	5	8	8	7	4	4	4	4	2	4	8	38	37	1	75
1 Babbler, Common :	33	52	122	61	72	64	68	10	8	7	19	21		173	322	388	0.8	710
2 Babbler, L'Grey :	15	41	28	4	29	11	46		56	18	26		46	50	246	124	2.0	370
3 Babbler, Jungle :	78	141	93	77	116	99	41	12	23	44	16	1	30	75	397	449	0.9	846
4 Babbler, Striated :				12	11			1							11	13	0.8	24
5 Babbler, Yel'eyed :		1	3	1	7		1	4			2			3	13	9	1.4	22
6 Barbet, Crim. Breas:	2	12		52	2	20		2	5	5	5	1		19	14	111	0.1	125
7 Barbet, L'Green :		3		1	2	6		1	2	2	1			13	5	26	0.2	31
8 BeeEater, Bluetail:												12			0	12	All Mo	12
9 BeeEater, Green :	15	51	31	32	32	44	21	49	11	35	28	21	8	90	146	322	0.5	468
10 BlueThroat :	1		4		9		16		8		14		5		57	0	All Wn	57
11 Bulbul, Redvented :	47	160	288	136	273	276	95	37	25	44	46	8	29	213	803	874	0.9	1677
12 Bulbul, R'Whisker :	4	6	11	5	10	2	1		1	3	2		4	16	33	32	1.0	65
13 Bulbul, W'Browed :			21												1	0	All Wn	1
14 Bulbul, W'Cheek :	8	47	22	28	12	24	25						1	29	68	128	0.5	196
15 Bushchat, Collared:		5	4	1	1							1	1		6	7	0.9	13
16 Bushchat, Pied :	3	9	3	4	10	7	10	10	9	13	10	5	16	103	61	151	0.4	212
17 Chat, BrownRock :		1	1		6	1		5						12	7	19	0.4	26
18 Crow, House :	173	418	266	147	232	191	144	124	3	132		20		305	818	1337	0.6	2155
19 Crow, Jungle :	2	5	10		2			1	1			8		15	15	29	0.5	44
20 Croupheasant :	6	3	2	6	6	6	8	4	2	3	4	2	1	2	29	26	1.1	55
21 Cuckoo, IndianHawk:		4		1		3	1	1		2					1	11	0.1	12
22 Cuckoo, PiedCrest :		6		11		1	4	5						4	4	27	0.1	31
23 Cuckoo, Plaintive :														3	0	3	All Mo	3
24 Cuckoo, Sirkeer :							1							1	1	1	1.0	2
25 CuckooShrikeLarge:		3													0	3	All Mo	3
26 Dove, Lit. Brown :	51	121	64	110	68	35	76	42	21	17	19	12	12	95	311	432	0.7	743
27 Dove, R'Turtle :		5	2			6			2						4	11	0.4	15
28 Dove, Ringed :	42	191	38	75	57	106	86	91	38	70	36	15	31	95	328	643	0.5	971
29 Dove, Spotted :		3					1								1	3	0.3	4
30 Drongo, Black :	10	45	14	28	7	38	13	36	23	13	10	7	8	41	85	208	0.4	293
31 Flycatch, Greyhead:					2						2				4	0	All Wn	4
32 Flycatch, Fantail :											2		3		5	0	All Wn	5
33 Flycatch, R'Breast:	5				11		1		4		3		2		26	0	All Wn	26
34 Hoopoe :	32	30	44	22	52	23	44	24	15	16	18	10	36	71	241	196	1.2	437
35 Hornbill, Grey :		2			2	2	2	8				1	2	5	6	18	0.3	24
36 Iora :		19	12	16	3	8	20	19		2					35	64	0.5	99
37 Koel :		9		4		8		1		2	1		15	28	16	52	0.3	68
38 Lark, R'WingBush :		8			1							1		11	1	20	0.1	21
39 Lark, Crested :		5	7		24		9	4			2		2	2	44	11	4.0	55
40 Lark, Others :		3	23		10	16	5	18	7	11	20		6	21	71	69	1.0	140
41 Martin, DuskyCrag :	6	27	2							16					8	43	0.2	51
42 Martin, Sand :		1	2	20	2	116	7	13	6	22	1	10			18	182	0.1	200
43 Minivet, Scarlet :			4	16			9	18	4	6		7	14		31	47	0.7	78
44 Minivet, Small :		4			3									1	3	5	0.6	8
45 Munia, Blackheaded:						1		10		5					0	16	All Mo	16
46 Munia, Red :		6	24		10			19	17	8	7	7	35	12	93	52	1.8	145
47 Munia, Spotted :										2			23		23	2	11.5	25
48 Munia, W'Backed :										6					0	6	All Mo	6
49 Munia, W'Throated:	5	16	82	47	15	2	20	8		9				21	122	103	1.2	225
50 Myna, Bank :	1	29	63	87	47	87	80	111	28	148	27	20	98	107	344	589	0.6	933
51 Myna, Brahmini :	56	49	31	45	53	21	14	5	9	12			19	36	182	168	1.1	350
52 Myna, Common :	149	297	174	273	357	260	235	139	116	178	127	37	201	396	1359	1580	0.9	2939



Table 1. (Contd) THE TOTALS OF BIRDS SEEN IN THE DELHI BIRD COUNTS.

	Win. Mon Ratio Total															#'s	#'s	Wn/Mo	#'s
	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87		116.6	107.6	1.1	224.2
Time per Count (Hours)	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6		147	127	1.2	274
Persons Participating	15	24	36	19	31	26	19	8	14	12	13	8	16	30		38	37	1	75
# Of Counts / Season	4	6	7	5	8	8	7	4	4	4	4	2	4	8					
0 53 Myna, Pied	30	69	108	78	100	104	100	63	79	127	78	44	64	131		559	616	0.9	1175
54 Nightjar								4								0	4 All Mo		4
55 NuthatchC'nutBell					1											1	0 All Wn		1
56 Oriole, Golden		4		5		18		4		1		5		22		0	59 All Mo		59
57 Parakeet, Alexand.	2				4				8	2	6	2		2		20	6	3.3	26
58 Parakeet, Bl'Head		5	3		1	1			1		7		3			15	6	2.5	21
59 Parakeet, RoseRing	88	218	194	93	210	139	125	15	49	33	126	17	126	104		918	619	1.5	1537
60 Partridge, Black	2	54	2	20	4			8		1				6		8	89	0.1	97
61 Partridge, Grey		39	25	12	17	6	10	6	2	3			1	27		55	93	0.6	148
62 Peafowl		49	4	28	35	18	25	13	7	1	13	4	7	65		91	178	0.5	269
63 Pigeon, BlueRock	258	475	444	62	287	362	200	176	361	182	149	291	112	324		1811	1872	1.0	3683
64 Pigeon, Green		2	12		9	9					16			52		37	63	0.6	100
65 Pipits(All)	22		1	8	11	5	24	15	3			3	1	7		62	38	1.6	100
66 Quail, Bush				1			1						2			3	1	3.0	4
67 Robin, Indian	32	36	93	40	71	29	59	54	10	1	6		4	126		275	286	1.0	561
68 Robin, Magpie	6	3	23	5	26	5	6	2	3	12	9		15	16		88	43	2.0	131
69 Redstart	9		8		37		10		7		5		5			81	0 All Wn		81
70 Roller, Indian	8	5	1	5		3	4	2	3	1	2			1		18	17	1.1	35
71 RosyPastor		179				1		522		60						0	762 All Mo		762
72 Shrike, BayBacked	3	41	4	10	15	4	5	3	4	3	2		5	9		38	70	0.5	108
73 Shrike, Grey	5	2	12	2	8	1	3		1				2			31	5	6.2	36
74 Shrike, Rfs'Backed	8	13	7	6	6	10	7	4	7	3	4		8	9		47	45	1.0	92
75 Shrike, Com. Wood	4		1				3				6			2		14	2	7.0	16
76 Sparrow, House	87	102	474	322	27	23	193	20		34				311		781	812	1.0	1593
77 Starling	1	30	34	162	81		59		27		34		33			269	192	1.4	461
78 StoneCurlew	28	24	50		34	15			18	16		15	1	1		131	71	1.8	202
79 Sunbird, Purple	16	59	31	30	64	26	2	1	11	28	6	9	2	66		132	219	0.6	351
80 Sunbird, P'Rumped				21												0	1 All Mo		0
81 Swallow, Cliff					7											7	0 All Wn		7
82 Swallow, Common	14	12	20	14	42	1	68	2	41	5	93	2	36	4		314	40	7.9	354
83 Swallow, RedRump		2						5					10	9		10	16	0.6	26
84 Swallow, WireTail	8	6	2			3			1	3		6				11	18	0.6	29
85 Swift, House	20	60	33	27	1	50	22	1		19			5	62		81	219	0.4	300
86 Tailor Bird	17	6	4	9	22	12	9	5	4	7	5	1	2	15		63	55	1.1	118
87 Thrush, BlueRock					2	1							1			3	1	3.0	4
88 Thrush, B'Throat									1							1	0 All Wn		1
89 TreePie		26	1	3	12	10	1		2		3		2	11		21	50	0.4	71
90 Wagtail, Grey			15		11		4		8		12	5	8			58	5	11.6	63
91 Wagtail, Pied			9	4	18	1	21	4	11	3	4		12			75	12	6.3	87
92 Wagtail, White	6		42		74		40		43		37		24			266	0 All Wn		266
93 Wagtail, Yellow	2		6		23	43	29		38		31	5	15			144	48	3.0	192
94 Wagtail, (Uniden.)	9		6		4	18	25		24		30	25	10			108	43	2.5	151
95 Warblers(All)	13	12	29	57	39	39	114	16	46		11	4	5	2		257	130	2.0	387
96 WrenWarblers, Ashy	12	24	26	23	23	39	23	23	5	22	5		3	46		97	177	0.5	274
97 WrenWarb, Indian	35	8	11	11	29	7	11	5	9	20		2	7	17		102	70	1.5	172
98 WrenWarb, Others	5	67	1	1	14			9		3				20		20	100	0.2	120
99 Weavers, Baya	1	2	94	34	3	8	13	4						24		111	72	1.5	183
100 Weavers, B'Breast										60						0	60 All Mo		60
101 Weavers, Streaked				2				1		6		1		12		0	22 All Mo		22
102 WhiteEye		18		3	9	6	27	1	6	14			2	4		44	46	1.0	90
103 Woodpecker, G'Back	1	7		2	4	2	3	1		3	2		2	7		12	22	0.5	34
104 Woodpeck, Mahratta		3		2	1	1		1		1				1		1	9	0.1	10
105 Wryneck											1					1	0 All Wn		1
Species of Land Birds	54	73	68	62	76	65	64	63	58	60	54	40	59	66		95	94	0.8	105
# of Land Birds Seen	149	330	3304	2403	2942	2504	2350	1822	1284	1525	1151	668	1183	3583		13710	16005	0.9	29715

Table 1 (Contd). THE TOTALS OF BIRDS SEEN IN THE DELHI BIRD COUNTS

	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	Mon. #s	Wn. #s	Ratio Wn/Mo	Total #s
Time per Count (Hours):	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	116.6	107.6	1.1	224.2
Persons Participating :	15	24	36	19	31	26	19	8	14	12	13	8	16	30	147	127	1.2	274
# Of Counts / Season :	4	6	7	5	8	8	7	4	4	4	4	2	4	8	38	37	1	75
<b>BIRDS OF PREY</b>																		
106 Buzzard, White Eyed :		1													0	1	All Mo	1
107 Eagle, Tawny :					1										1	0	All Wn	1
108 Harrier, Marsh :			1		1	1	1								3	1	3.0	4
109 Harrier, Pale :							1								1	0	All Wn	1
110 Kestrel :						1	2								2	1	2.0	3
111 Kites, Black Wing :	5		4	1	5	5	1							2	15	8	1.9	23
112 Kites, Pariah :	99	176	157	81	83	100	63	58	150	89	106	89	67	151	725	744	1.0	1469
113 Owl, Barn :		3													0	3	All Mo	3
114 Owl, Great Horned :	1		2	3	1		3							2	7	5	1.4	12
115 Owl, Spotted :			2	2			1				1			5	4	7	0.6	11
116 Shikra :		3				2								1	0	6	All Mo	6
117 Vulture, King :		2			1	1									1	3	0.3	4
118 Vulture, Long Bill :	7	1		16	4	1			4			2		2	15	22	0.7	37
119 Vulture, Scavenger :	69	5	55		17	9	9		2	5		4	1	11	153	34	4.5	187
120 Vulture, W Backed :	30	95	78	189	86	23	56	8	16	24	73	10	20	78	359	427	0.8	786
# of Birds Of Prey :	6	8	7	6	9	9	9	2	4	3	3	4	3	8	12	13	0.9	15
Total Birds Of Prey :	211	286	299	292	199	143	137	66	172	118	180	105	88	252	1286	1262	1.0	2548
<b>WATER BIRDS</b>																		
121 Avocet :								4		30					34	0	All Wn	34
122 Bittern, Little :									2						0	2	All Mo	2
123 Coot :			42												42	0	All Wn	42
124 Cormorant (All) :	120	77	29	11	10	131	1	22	37	70	7	119	24	50	228	480	0.5	708
125 Crane, Demoisele :												11			11	0	All Wn	11
126 Dabchick :		1	10		6	2	1	2	8	3		5	29		54	13	4.2	67
127 Duck, Brahmini :	10		96		35		5		98		16	7	10		270	7	38.6	277
128 Duck, Mallard :													11		11	0	All Wn	11
129 Duck, Nakta :		6			31		18	26	2		3	3	10		37	39	0.1	68
130 Duck, Pintail :	341		630		83			1220			251		701		3226	0	All Wn	3226
131 Duck, Pochard, Com. :			75								11				86	0	All Wn	86
132 Duck, Poch. R Head :					14										14	0	All Wn	14
133 Duck, Poch. Tufted :			12		43						43				98	0	All Wn	98
134 Duck, Shoveller :	232		1126		356			275			128		135		2252	0	All Wn	2252
135 Duck, Spotbill :	199	25	128		120	56		70	170	23	26	130	75	142	718	446	1.6	1164
136 Duck, Teal, Common :			365		108			277			210		224		1184	0	All Wn	1184
137 Duck, Teal, Cotton :		2					1								0	3	All Mo	3
138 Duck, Wigeon :					10						5				15	0	All Wn	15
139 Egret, Cattle :	1	71	8	11	15	69	39	36	30	41	25	99	60	100	178	427	0.4	605
140 Egret, Large :		5	2	2	1			2	2		1	1	1	1	7	11	0.6	18
141 Egret, Little :	15	49	6	22	16	39	1	14	50	38	2	39		47	90	248	0.4	338
142 Goose, Barheaded :		7							4						4	7	0.6	11
143 Goose, Greylag :					2			56							58	0	All Wn	58
144 Gulls, Blackheaded :			2								105		71		178	0	All Wn	178
145 Gulls, Brownheaded :			2												2	0	All Wn	2
146 Gull, (Uniden.) :			235		163		242		354		204		202		1400	0	All Wn	1400
147 Heron, Grey :		2	1		1	1	2							1	4	4	1.0	8
148 Heron, Night :		141			1	45		52	60	18		181		147	61	584	0.1	645
149 Heron, Pond :	21	27	20	37	7	16	20	26	13	21	7	41	5	24	93	192	0.5	285
150 Heron, Purple :				2	1	2	1	2	1	4		1		1	3	12	0.3	15
151 Ibis, White :														7	0	7	All Mo	7
152 Jacana, Bronze Wing :						1									0	1	All Mo	1
153 Jacana, Phe's tail :		9		9		5		8							0	31	All Mo	31
154 Kingfisher, L'blue :			1	1	2		2		2	1				1	7	3	2.3	10



Table 1 (Contd). THE TOTALS OF BIRDS SEEN IN THE DELHI BIRD COUNTS.

	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	Mon. #s	Win. #s	Ratio Wn/Mo	Total #s
Time per Count (Hours):	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	116.6	107.6	1.1	224.2
Persons Participating :	15	24	36	19	31	26	19	8	14	12	13	8	16	30	147	127	1.2	274
# Of Counts / Season :	4	6	7	5	8	8	7	4	4	4	4	2	4	8	38	37	1	75
0 155 Kingfisher, Pied :		6		2		3	4	3	9	1	2	2			15	17	0.9	32
156 Kingfisher, S'bill :				1										1	0	2	All Mo	2
157 Kingfish, W'Breast :	7	9	9	9	50	13	7	9	5	7	2	4	7	13	87	64	1.4	151
158 Lapwing, R'Wattled :	65	46	128	41	148	51	125	83	162	77	110	108	78	125	816	531	1.5	1347
159 Lapwing, Y'Wattled :	3		5		9										17	0	All Wn	17
160 Lapwing, W'Tailed :									2						2	0	All Wn	2
161 Moorhen, Indian :	5	2			8	2		7				7	5	18	18	36	0.5	54
162 Pelican, Rosy :													20		20	0	All Wn	20
163 Plovers, Kentish :							4			2	4				8	2	4.0	10
164 Plovers, LitRinged :				2				3	1	1		4			3	8	0.4	11
165 Plover, Spurwing :							7	2	1						8	2	4.0	10
166 Pranticole, Sm. Ind :							7								0	7	All Mo	7
167 Sandpiper, Common :	6		10		16	1	6	6	7	1	8	2	8	2	61	12	5.1	73
168 Sandpiper, Green :									2	2	1	7			3	9	0.3	12
169 Sandpiper, R'shank :			2					1		2		5			2	8	0.3	10
170 Sandpiper, Spotted :			1		3		1	5		1		9			5	15	0.3	20
171 Sandpiper, Others :							50				35	22	30	9	115	31	3.7	146
172 Stilt, B'Winged :			33		17				82		52		45	45	229	45	5.1	274
173 Stint, Little :			44	1	5				44		13		7		113	1	113.0	114
174 Stork, Blackneck :							3								3	0	All Wn	3
175 Stork, Painted :		4	104	7	171	3	21	24	23	3	2	2		1	321	44	7.3	365
176 Terns (All) :		4	2	14	3			5	1		17	5		33	23	61	0.4	84
177 Waterhen, W'Breast :	10	18	3	1	10	26	3	9	4	2		7	5	12	35	75	0.5	110
Species of WaterBirds :	14	20	30	16	33	18	21	25	32	22	27	24	24	22	49	37	1.3	57
# of Water Birds seen :	1035	511	3131	171	1436	466	545	417	3030	322	1317	810	1767	790	12269	3487	3.5	15748
TOTAL BIRDS SEEN :	2742	4297	6734	2866	4577	3113	3032	2305	4482	1965	2618	1583	3038	4625	127231	20754	1.3	47977
TOTAL SPECIES SEEN :	74	101	105	84	118	92	94	90	94	85	84	68	86	96	156	144	1.1	177



Table 2. THE NUMBERS OF BIRDS SEEN IN THE DELHI BIRD COUNTS

	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	#'s	#'s	Wn/Mo	#'s
Time per Count (Hours):	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	116.6	107.6	1.1	224.2
Persons Participating :	15	24	36	19	31	26	19	8	14	12	13	8	16	30	147	127	1.2	274
# Of Counts / Season :	4	6	7	5	8	8	7	4	4	4	4	2	4	8	38	37	1	75
1 Pigeon, BlueRock	258	475	444	62	287	362	200	176	361	182	149	291	112	324	1811	1872	1.0	3683
2 Duck, Pintail	341		630		83				1220		251		701		3226	0	All Wn	3226
3 Myna, Common	149	297	174	273	357	260	235	139	116	178	127	37	201	396	1359	1580	0.9	2939
4 Duck, Shoveller	232		1126		356				275		128		135		2252	0	All Wn	2252
5 Crow, House	173	418	266	147	232	191	144	124	3	132		20		305	818	1337	0.6	2155
6 Bulbul, Redvented	47	160	288	136	273	276	95	37	25	44	46	8	29	213	803	874	0.9	1677
7 Sparrow, House	87	102	474	322	27	23	193	20		34				311	781	812	1.0	1593
8 Parakeet, RoseRing	88	218	194	93	210	139	125	15	49	33	126	17	126	104	918	619	1.5	1537
9 Kites, Pariah	99	176	157	81	83	100	63	58	150	89	106	89	67	151	725	744	1.0	1469
10 Gull, (Uniden.)			235		163		242		354		204		202		1400	0	All Wn	1400
11 Lapwing, R' Wattled	65	46	128	41	148	51	125	83	162	77	110	108	78	125	816	531	1.5	1347
12 Duck, Teal, Common			365		108				277		210		224		1184	0	All Wn	1184
13 Myna, Pied	30	69	108	78	100	104	100	63	79	127	78	44	64	131	559	616	0.9	1175
14 Duck, Spotbill	199	25	128		120	56		70	170	23	26	130	75	142	718	446	1.6	1164
15 Dove, Ringed	42	191	38	75	57	106	86	91	38	70	36	15	31	95	328	643	0.5	971
16 Myna, Bank	1	29	63	87	47	87	80	111	28	148	27	20	98	107	344	589	0.6	933
17 Babbler, Jungle	78	141	93	77	116	99	41	12	23	44	16	1	30	75	397	449	0.9	846
18 Vulture, W' Backed	30	95	78	189	86	23	56	8	16	24	73	10	20	78	359	427	0.8	786
19 Rosy Pastor		179				1		522		60					0	762	All Mo	762
20 Dove, Lit. Brown	51	121	64	110	68	35	76	42	21	17	19	12	12	95	311	432	0.7	743
21 Babbler, Common	33	52	122	61	72	64	68	10	8	7	19	21		173	322	388	0.8	710
22 Cormorant (All)	120	77	29	11	10	131	1	22	37	70	7	119	24	50	228	480	0.5	708
23 Heron, Night		141			1	45		52	60	18		181		147	61	584	0.1	645
24 Egret, Cattle	1	71	8	11	15	69	39	36	30	41	25	99	60	100	178	427	0.4	605
25 Robin, Indian	32	36	93	40	71	29	59	54	10	1	6		4	126	275	286	1.0	561
26 Bee Eater, Green	15	51	31	32	32	44	21	49	11	35	28	21	8	90	146	322	0.5	468
27 Starling	1	30	34	162	81		59		27		34		33		269	192	1.4	461
28 Hoopoe	32	30	44	22	52	23	44	24	15	16	18	10	36	71	241	196	1.2	437
29 Warblers (All)	13	12	29	57	39	39	114	16	46		11	4	5	2	257	130	2.0	387
30 Babbler, L' Grey	15	41	28	4	29	11	46		56	18	26		46	50	246	124	2.0	370
31 Swallow, Common	14	12	20	14	42	1	68	2	41	5	93	2	36	4	314	40	7.9	354
32 Sunbird, Purple	16	59	31	30	64	26	2	1	11	28	6	9	2	66	132	219	0.6	351
33 Myna, Brahmini	56	49	31	45	53	21	14	5	9	12		19	36	182	168	1.1	350	
34 Egret, Little	15	49	6	22	16	39	1	14	50	38	2	39		47	90	248	0.4	338
35 Swift, House	20	60	33	27	1	50	22	1		19			5	62	81	219	0.4	300
36 Drongo, Black	10	45	14	28	7	38	13	36	23	13	10	7	8	41	85	208	0.4	293
37 Heron, Pond	21	27	20	37	7	16	20	26	13	21	7	41	5	24	93	192	0.5	285
38 Duck, Brahmini	10		96		35		5		98		16	7	10		270	7	38.6	277
39 Stilt, B' Winged			33		17				82		52		45	45	229	45	5.1	274
40 Wren Warblers, Ashy	12	24	26	23	23	39	23	23	5	22	5		3	46	97	177	0.5	274
41 Peafowl		49	4	28	35	18	25	13	7	1	13	4	7	65	91	178	0.5	269
42 Wagtail, White	6		42		74		40		43		37		24		266	0	All Wn	266
43 Munia, W' Throated	5	16	82	47	15	2	20	8		9				21	122	103	1.2	225
44 Bushchat, Pied	3	9	3	4	10	7	10	10	9	13	10	5	16	103	61	151	0.4	212
45 Stone Curlew	28	24	50		34	15			18	16		15	1	1	131	71	1.8	202
46 Martin, Sand		1	2	20	2	116	7	13	6	22	1	10			18	182	0.1	200
47 Bulbul, W' Cheek	8	47	22	28	12	24	25						1	29	68	128	0.5	196
48 Stork, Painted		4	104	7		3	21	24	23	3	2	2		1	150	44	3.4	194
49 Wagtail, Yellow	2		6		23	43	29		38		31	5	15		144	48	3.0	192
50 Vulture, Scavenger	69	5	55		17	9	9		2	5		4	1	11	153	34	4.5	187
51 Weavers, Baya	1	2	94	34	3	8	13	4						24	111	72	1.5	183
52 Gulls, Blackheaded			2												178	0	All Wn	178

Table 2 (Contd.). THE NUMBERS OF BIRDS SEEN IN THE DELHI BIRD COUNTS

	Win. Mon. Ratio Total																		
	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	Wn88	Mo88	Ratio	Total	
Time per Count (Hours):	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	116.6	107.6	1.1	224.2	
Persons Participating :	15	24	36	19	31	26	19	8	14	12	13	8	16	30	147	127	1.2	274	
# Of Counts / Season :	4	6	7	5	8	8	7	4	4	4	4	2	4	8	38	37	1	75	
0 53 WrenWarb, Indian	35	8	11	11	29	7	11	5	9	20		2	7	17	102	70	1.5	172	
54 Kingfish, W' Breast	7	9	9	9	50	13	7	9	5	7	2	4	7	13	87	64	1.4	151	
55 Wagtail, (Uniden.)	9		6		4	18	25		24		30	25	10		108	43	2.5	151	
56 Partridge, Grey		39	25	12	17	6	10	6	2	3			1	27	55	93	0.6	148	
57 Sandpiper, Others							50				35	22	30	9	115	31	3.7	146	
58 Munia, Red		6	24		10			19	17	8	7	7	35	12	93	52	1.8	145	
59 Lark, Others		3	23		10	16	5	18	7	11	20		6	21	71	69	1.0	140	
60 Robin, Magpie	6	3	23	5	26	5	6	2	3	12	9		15	16	88	43	2.0	131	
61 Barbet, Crim. Breast	2	12		52	2	20		2	5	5	5	1		19	14	111	0.1	125	
62 WrenWarb, Others	5	67	1	1	14			9		3				20	20	100	0.2	120	
63 Tailor Bird	17	6	4	9	22	12	9	5	4	7	5	1	2	15	63	55	1.1	118	
64 Stint, Little			44	1	5				44		13		7		113	1	113.0	114	
65 Waterhen, W' Breast	10	18	3	1	10	26	3	9	4	2		7	5	12	35	75	0.5	110	
66 Shrike, Bay Backed	3	41	4	10	15	4	5	3	4	3	2		5	9	38	70	0.5	108	
67 Pigeon, Green		2	12		9	9					16			52	37	63	0.6	100	
68 Pipits (All)	22		1	8	11	5	24	15	3			3	1	7	62	38	1.6	100	
69 Iora		19	12	16	3	8	20	19		2					35	64	0.5	99	
70 Duck, Poch. Tufted			12		43						43				98	0	All Wn	98	
71 Partridge, Black	2	54	2	20	4			8		1				6	8	89	0.1	97	
72 Shrike, Rfs' Backed	6	13	7	6	6	10	7	4	7	3	4		8	9	47	45	1.0	92	
73 White Eye		18		3	9	6	27	1	6	14			2	4	44	46	1.0	90	
74 Wagtail, Pied			9	4	18	1	21	4	11	3	4		12		75	12	6.3	87	
75 Duck, Pochard, Com.			75								11				86	0	All Wn	86	
76 Terns (All)		4	2	14	3			5	1		17	5		33	23	61	0.4	84	
77 Redstart	9		8		37		10		7		5		5		81	0	All Wn	81	
78 Minivet, Scarlet			4	16			9	18	4	6		7	14		31	47	0.7	78	
79 Sandpiper, Common	6		10		16	1	6	6	7	1	8	2	8	2	61	12	5.1	73	
80 Tree Pie		26	1	3	12	10	1		2		3		2	11	21	50	0.4	71	
81 Duck, Nakta		6			31			18	26	2		3	3	10	3	39	0.1	68	
82 Koel		9		4		8		1		2	1		15	28	16	52	0.3	68	
83 Dabchick		1	10		6	2	1	2	8	3		5	29		54	13	4.2	67	
84 Bulbul, R' Whisker	4	6	11	5	10	2	1		1	3	2		4	16	33	32	1.0	65	
85 Wagtail, Grey			15		11		4		8		12	5	8		58	5	11.6	63	
86 Weavers, B' Breast										60					0	60	All Mo	60	
87 Oriole, Golden		4		5		18		4		1		5		22	0	59	All Mo	59	
88 Goose, Greylag					2				56						58	0	All Wn	58	
89 Blue Throat	1		4		9		16		8		14		5		57	0	All Wn	57	
90 Crow Pheasant	6	3	2	6	6	6	8	4	2	3	4	2	1	2	29	26	1.1	55	
91 Lark, Crested		5	7		24		9	4			2		2	2	44	11	4.0	55	
92 Moorhen, Indian	5	2			8	2		7				7	5	18	18	36	0.5	54	
93 Martin, Dusky Crag	6	27	2							16					8	43	0.2	51	
94 Crow, Jungle	2	5	10		2			1	1			8		15	15	29	0.5	44	
95 Coot			42												42	0	All Wn	42	
96 Vulture, Long Bill	7	1		16	4	1			4			2		2	15	22	0.7	37	
97 Shrike, Grey	5	2	12	2	8	1	3		1				2		31	5	6.2	36	
98 Roller, Indian	8	5	1	5		3	4	2	3	1	2			1	18	17	1.1	35	
99 Avocet									4		30				34	0	All Wn	34	
100 Woodpecker, G' Back	1	7		2	4	2	3	1		3	2		2	7	12	22	0.5	34	
101 Kingfisher, Pied		6		2		3	4	3	9	1	2	2			15	17	0.9	32	
102 Barbet, L' Green		3		1	2	6		1	2	2	1			13	5	26	0.2	31	
103 Cuckoo, Pied Crest		6		11		1	4	5						4	4	27	0.1	31	
104 Jacana, Phe's Tail		9		9		5		8							0	31	All Mo	31	
105 Swallow, Wire Tail	8	6	2			3			1	3		6			11	18	0.6	29	
106 Chat, Brown Rock		1	1		6	1		5						12	7	19	0.4	26	



Table 2 (Contd.). THE NUMBERS OF BIRDS SEEN IN THE DELHI BIRD COUNTS

	Win. Mon. Ratio Total																	
	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	#'s	#'s	Wn/Mo	#'s
Time per Count (Hours)	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	116.6	107.6	1.1	224.2
Persons Participating	15	24	36	19	31	26	19	8	14	12	13	8	16	30	147	127	1.2	274
# Of Counts / Season	4	6	7	5	8	8	7	4	4	4	4	2	4	8	38	37	1	75
0 106 Chat, BrownRock		1	1		6	1		5						12	7	19	0.4	26
107 Flycatch, R'Breast	5				11		1		4		3		2		26	0	All Wn	26
108 Parakeet, Alexand.	2				4				8	2	6	2		2	20	6	3.3	26
109 Swallow, RedRump		2						5					10	9	10	16	0.6	26
110 Munia, Spotted										2			23		23	2	11.5	25
111 Babbler, Striated				12	11			1							11	13	0.8	24
112 Hornbill, Grey		2			2	2	2	8				1	2	5	6	18	0.3	24
113 Kites, BlackWing	5		4	1	5	5	1							2	15	8	1.9	23
114 Babbler, Yel'eyed		1	3	1	7		1	4			2			3	13	9	1.4	22
115 Weavers, Streaked				2				1		6		1		12	0	22	All Mo	22
116 Lark, R'WingBush		8			1							1		11	1	20	0.1	21
117 Parakeet, Bl'Head		5	3		1	1			1		7		3		15	6	2.5	21
118 Pelican, Rosy													20		20	0	All Wn	20
119 Sandpiper, Spotted			1		3		1	5		1		9			5	15	0.3	20
120 Egret, Large		5	2	2	1			2	2		1	1	1	1	7	11	0.6	18
121 Lapwing, Y'Wattled	3		5		9										17	0	All Wn	17
122 Munia, Blackheaded						1		10		5					0	16	All Mo	16
123 Shrike, Com. Wood	4		1				3				6			2	14	2	7.0	16
124 Dove, R'Turtle		5	2			6			2						4	11	0.4	15
125 Duck, Wigeon					10						5				15	0	All Wn	15
126 Heron, Purple				2	1	2	1	2	1	4		1		1	3	12	0.3	15
127 Duck, Poch. R'Head					14										14	0	All Wn	14
128 Bushchat, Collared		5	4	1	1							1	1		6	7	0.9	13
129 BeeEater, Bluetail												12			0	12	All Mo	12
130 Cuckoo, Indian Hawk		4		1		3	1	1		2					1	11	0.1	12
131 Owl, Great Horned	1		2	3	1		3							2	7	5	1.4	12
132 Sandpiper, Green									2	2	1	7			3	9	0.3	12
133 Crane, Demoisele													11		11	0	All Wn	11
134 Duck, Mallard													11		11	0	All Wn	11
135 Goose, Barheaded		7							4						4	7	0.6	11
136 Owl, Spotted			2	2			1				1			5	4	7	0.6	11
137 Plovers, L'Ringed					2			3	1	1		4			3	8	0.4	11
138 Kingfisher, L'blue			1	1	2		2		2	1				1	7	3	2.3	10
139 Plovers, Kentish							4			2	4				8	2	4.0	10
140 Plover, Spurwing							7	2	1						8	2	4.0	10
141 Sandpiper, R'shank			2					1		2		5			2	8	0.3	10
142 Woodpeck, Mahratta		3		2	1	1		1		1				1	1	9	0.1	10
143 Heron, Grey		2	1		1	1	2							1	4	4	1.0	8
144 Minivet, Small		4			3									1	3	5	0.6	8
145 Ibis, White														7	0	7	All Mo	7
146 Pranticole, Sm. Ind								7							0	7	All Mo	7
147 Swallow, Cliff					7										7	0	All Wn	7
148 Munia, W'Backed										6					0	6	All Mo	6
149 Shikra		3				2								1	0	6	All Mo	6
150 Flycatch, Fantail											2		3		5	0	All Wn	5
151 Dove, Spotted		3					1								1	3	0.3	4
152 Flycatch, Greyhead					2						2				4	0	All Wn	4
153 Harrier, Marsh			1		1	1	1								3	1	3.0	4
154 Nightjar								4							0	4	All Mo	4
155 Quail, Bush				1			1						2		3	1	3.0	4
156 Thrush, BlueRock					2	1							1		3	1	3.0	4
157 Vulture, King		2			1	1									1	3	0.3	4

Table 2 (Contd.). THE NUMBERS OF BIRDS SEEN IN THE DELHI BIRD COUNTS

	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	Win. #s	Mon. #s	Ratio Wn/Mo	Total #s
Time per Count (Hours)	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	116.6	107.6	1.1	224.2
Persons Participating	15	24	36	19	31	26	19	8	14	12	13	8	16	30	147	127	1.2	274
# Of Counts / Season	4	6	7	5	8	8	7	4	4	4	4	2	4	8	38	37	1	75
0 158 CuckooShrikeLarge			3												0	3	All Mo	3
159 Cuckoo,Plaintive														3	0	3	All Mo	3
160 Duck,Teal,Cotton			2						1						0	3	All Mo	3
161 Kestrel						1	2								2	1	2.0	3
162 Owl,Barn			3												0	3	All Mo	3
163 Stork,Blackneck							3								3	0	All Wn	3
164 Bittern,Little										2					0	2	All Mo	2
165 Cuckoo,Sirkeer							1							1	1	1	1.0	2
166 Gulls,Brownheaded			2												2	0	All Wn	2
167 Kingfisher,S'bill				1										1	0	2	All Mo	2
168 Lapwing,W'Tailed									2						2	0	All Wn	2
169 Bulbul,W'Browed			?												1	0	All Wn	1
170 Buzzard,WhiteEyed			1												0	1	All Mo	1
171 Eagle,Tawny					1										1	0	All Wn	1
172 Harrier,Pale								1							1	0	All Wn	1
173 Jacana,BronzeWing						1									0	1	All Mo	1
174 NuthatchC'nutBell					1										1	0	All Wn	1
175 Thrush,B'Throat									1						1	0	All Wn	1
176 Wryneck												1			1	0	All Wn	1
177 Sunbird,P'Rumped				?											0	1	All Mo	0



Table 3. THE SEASONAL STATUS OF BIRDS SEEN IN THE DELHI BIRD COUNTS

	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	Win. #s	Mon. #s	Ratio Wn/Mo	Total #s
Time per Count (Hours)	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	116.6	107.6	1.1	224.2
Persons Participating	15	24	36	19	31	26	19	8	14	12	13	8	16	30	147	127	1.2	274
# Of Counts / Season	4	6	7	5	8	8	7	4	4	4	4	2	4	8	38	37	1	75
1 RosyPastor		179				1		522		60					0	762	All Mo	762
2 Weavers, B' Breast										60					0	60	All Mo	60
3 Oriole, Golden		4		5		18		4		1		5		22	0	59	All Mo	59
4 Weavers, Streaked				2				1		6		1		12	0	22	All Mo	22
5 Munia, Blackheaded						1		10		5					0	16	All Mo	16
6 BeeEater, Bluetail												12			0	12	All Mo	12
7 Munia, W' Backed										6					0	6	All Mo	6
8 Nightjar								4							0	4	All Mo	4
9 CuckooShrikeLarge		3													0	3	All Mo	3
10 Cuckoo, Plaintive														3	0	3	All Mo	3
11 Jacana, Phe's tail		9		9		5		8							0	31	All Mo	31
12 Ibis, White														7	0	7	All Mo	7
13 Pranticole, Sm. Ind								7							0	7	All Mo	7
14 Shikra		3				2								1	0	6	All Mo	6
15 Owl, Barn		3													0	3	All Mo	3
16 Duck, Teal, Cotton		2						1							0	3	All Mo	3
17 Kingfisher, S'bill				1										1	0	2	All Mo	2
18 Bittern, Little										2					0	2	All Mo	2
19 Buzzard, WhiteEyed		1													0	1	All Mo	1
20 Jacana, BronzeWing						1									0	1	All Mo	1
21 Sunbird, P' Rumped				21											0	1	All Mo	0
22 Lark, R' WingBush		8			1							1		11	1	20	0.1	21
23 Duck, Nakta		6			31			18	26	2		3	3	10	37	39	0.9	68
24 Partridge, Black	2	54	2	20	4			8		1				6	8	89	0.1	97
25 Cuckoo, Indian Hawk		4		1		3	1	1		2					1	11	0.1	12
26 Martin, Sand		1	2	20	2	116	7	13	6	22	1	10			18	182	0.1	200
27 Heron, Night		141			1	45		52	60	18		181		147	61	584	0.1	645
28 Woodpeck, Mahratta		3		2	1	1		1		1				1	1	9	0.1	10
29 Barbet, Crim. Breas	2	12		52	2	20		2	5	5	5	1		19	14	111	0.1	125
30 Cuckoo, Pied Crest		6		11		1	4	5						4	4	27	0.1	31
31 Martin, Dusky Crag	6	27	2							16					8	43	0.2	51
32 Barbet, L' Green		3		1	2	6		1	2	2	1			13	5	26	0.2	31
33 Wren Warb, Others	5	67	1	1	14			9		3				20	20	100	0.2	120
34 Heron, Purple				2	1	2	1	2	1	4		1		1	3	12	0.3	15
35 Sandpiper, R' shank			2					1		2		5			2	8	0.3	10
36 Koel		9		4		8		1		2	1		15	28	16	52	0.3	68
37 Hornbill, Grey		2			2	2	2	8				1	2	5	6	18	0.3	24
38 Sandpiper, Spotted			1		3		1	5		1		9			5	15	0.3	20
39 Sandpiper, Green									2	2	1	7			3	9	0.3	12
40 Dove, Spotted		3					1								1	3	0.3	4
41 Vulture, King		2			1	1									1	3	0.3	4
42 Egret, Little	15	49	6	22	16	39	1	14	50	38	2	39		47	90	248	0.4	338
43 Dove, R' Turtle		5	2			6			2						4	11	0.4	15
44 Chat, Brown Rock		1	1		6	1		5						12	7	19	0.4	26
45 Swift, House	20	60	33	27	1	50	22	1		19			5	62	81	219	0.4	300
46 Plovers, L' Ringed					2			3	1	1		4			3	8	0.4	11
47 Terns (All)		4	2	14	3			5	1		17	5		33	23	61	0.4	84
48 Bushchat, Pied	3	9	3	4	10	7	10	10	9	13	10	5	16	103	61	151	0.4	212
49 Drongo, Black	10	45	14	28	7	38	13	36	23	13	10	7	8	41	85	208	0.4	293
50 Egret, Cattle	1	71	8	11	15	69	39	36	30	41	25	99	60	100	178	427	0.4	605
51 Tree Pie		26	1	3	12	10	1		2		3		2	11	21	50	0.4	71

Table 3 (Contd). THE SEASONAL STATUS OF BIRDS SEEN IN THE DELHI BIRD COUNTS

	Win. Mon. Ratio Total																	
	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	Wn88	Mo88	Wn/Mo	Total
Time per Count (Hours)	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	116.6	107.6	1.1	224.2
Persons Participating	15	24	36	19	31	26	19	8	14	12	13	8	16	30	147	127	1.2	274
# Of Counts / Season	4	6	7	5	8	8	7	4	4	4	4	2	4	8	38	37	1	75
0 52 BeeEater, Green	15	51	31	32	32	44	21	49	11	35	28	21	8	90	146	322	0.5	468
53 Waterhen, W' Breast	10	18	3	1	10	26	3	9	4	2		7	5	12	35	75	0.5	110
54 Cormorant (All)	120	77	29	11	10	131	1	22	37	70	7	119	24	50	228	480	0.5	708
55 Heron, Pond	21	27	20	37	7	16	20	26	13	21	7	41	5	24	93	192	0.5	285
56 Moorhen, Indian	5	2			8	2		7				7	5	18	18	36	0.5	54
57 Dove, Ringed	42	191	38	75	57	106	86	91	38	70	36	15	31	95	328	643	0.5	971
58 Peafowl		49	4	28	35	18	25	13	7	1	13	4	7	65	91	178	0.5	269
59 Crow, Jungle	2	5	10		2			1	1			8		15	15	29	0.5	44
60 Bulbul, W' Cheek	8	47	22	28	12	24	25						1	29	68	128	0.5	196
61 Shrike, Bay Backed	3	41	4	10	15	4	5	3	4	3	2		5	9	38	70	0.5	108
62 Woodpecker, G' Back	1	7		2	4	2	3	1		3	2		2	7	12	22	0.5	34
63 Iora		19	12	16	3	8	20	19		2					35	64	0.5	99
64 Wren Warblers, Ashy	12	24	26	23	23	39	23	23	5	22	5		3	46	97	177	0.5	274
65 Goose, Barheaded		7						4							4	7	0.6	11
66 Owl, Spotted			2	2			1				1			5	4	7	0.6	11
67 Myna, Bank	1	29	63	87	47	87	80	111	28	148	27	20	98	107	344	589	0.6	933
68 Pigeon, Green		2	12		9	9					16			52	37	63	0.6	100
69 Partridge, Grey		39	25	12	17	6	10	6	2	3			1	27	55	93	0.6	148
70 Minivet, Small		4			3									1	3	5	0.6	8
71 Sunbird, Purple	16	59	31	30	64	26	2	1	11	28	6	9	2	66	132	219	0.6	351
72 Swallow, Wire Tail	8	6	2			3			1	3		6			11	18	0.6	29
73 Crow, House	173	418	266	147	232	191	144	124	3	132		20		305	818	1337	0.6	2155
74 Swallow, Red Rump		2						5					10	9	10	16	0.6	26
75 Egret, Large		5	2	2	1			2	2		1	1	1	1	7	11	0.6	18
76 Minivet, Scarlet			4	16			9	18	4	6		7	14		31	47	0.7	78
77 Vulture, Long Bill	7	1		16	4	1			4			2		2	15	22	0.7	37
78 Dove, Lit. Brown	51	121	64	110	68	35	76	42	21	17	19	12	12	95	311	432	0.7	743
79 Babbler, Common	33	52	122	61	72	64	68	10	8	7	19	21		173	322	388	0.8	710
80 Vulture, W' Backed	30	95	78	189	86	23	56	8	16	24	73	10	20	78	359	427	0.8	786
81 Babbler, Striated				12	11			1							11	13	0.8	24
82 Bushchat, Collared		5	4	1	1							1	1		6	7	0.9	13
83 Myna, Common	149	297	174	273	357	260	235	139	116	178	127	37	201	396	1359	1580	0.9	2939
84 Kingfisher, Pied		6		2		3	4	3	9	1	2	2			15	17	0.9	32
85 Babbler, Jungle	78	141	93	77	116	99	41	12	23	44	16	1	30	75	397	449	0.9	846
86 Myna, Pied	30	69	108	78	100	104	100	63	79	127	78	44	64	131	559	616	0.9	1175
87 Bulbul, Red vented	47	160	288	136	273	276	95	37	25	44	46	8	29	213	803	874	0.9	1677
88 White Eye		18		3	9	6	27	1	6	14			2	4	44	46	1.0	90
89 Robin, Indian	32	36	93	40	71	29	59	54	10	1	6		4	126	275	286	1.0	561
90 Sparrow, House	87	102	474	322	27	23	193	20		34				311	781	812	1.0	1593
91 Pigeon, Blue Rock	258	475	444	62	287	362	200	176	361	182	149	291	112	324	1811	1872	1.0	3683
92 Kites, Pariah	99	176	157	81	83	100	63	58	150	89	106	89	67	151	725	744	1.0	1469
93 Heron, Grey		2	1		1	1	2							1	4	4	1.0	8
94 Cuckoo, Sirkeer							1							1	1	1	1.0	2
95 Lark, Others		3	23		10	16	5	18	7	11	20		6	21	71	69	1.0	140
96 Bulbul, R' Whisker	4	6	11	5	10	2	1		1	3	2		4	16	33	32	1.0	65
97 Shrike, Rfs' Backed	8	13	7	6	6	10	7	4	7	3	4		8	9	47	45	1.0	92
98 Roller, Indian	8	5	1	5		3	4	2	3	1	2			1	18	17	1.1	35
99 Myna, Brahmini	56	49	31	45	53	21	14	5	9	12			19	36	182	168	1.1	350
100 Crowspheasant	6	3	2	6	6	6	8	4	2	3	4	2	1	2	29	26	1.1	55
101 Tailor Bird	17	6	4	9	22	12	9	5	4	7	5	1	2	15	63	55	1.1	118
102 Munia, W' Throated	5	16	82	47	15	2	20	8		9				21	122	103	1.2	225
103 Hoopoe	32	30	44	22	52	23	44	24	15	16	18	10	36	71	241	196	1.2	437
104 Kingfish, W' Breast	7	9	9		50	13	7	9	5	7	2	4	7	13	87	64	1.4	151
105 Owl, Great Horned	1		2		1		3							2	7	5	1.4	12



Table 3 (Contd). THE SEASONAL STATUS OF BIRDS SEEN IN THE DELHI BIRD COUNTS

	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	Win. #s	Mon. #s	Ratio Wn/Mo	Total #s
Time per Count (Hours):	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	116.6	107.6	1.1	224.2
Persons Participating :	15	24	36	19	31	26	19	8	14	12	13	8	16	30	147	127	1.2	274
# Of Counts / Season :	4	6	7	5	8	8	7	4	4	4	4	2	4	8	38	37	1	75
0 106 Starling	1	30	34	162	81		59		27		34		33		269	192	1.4	461
107 Babbler, Yel'eyed :		1	3	1	7		1	4			2			3	13	9	1.4	22
108 WrenWarb; Indian :	35	8	11	11	29	7	11	5	9	20		2	7	17	102	70	1.5	172
109 Parakeet, RoseRing :	88	218	194	93	210	139	125	15	49	33	126	17	126	104	918	619	1.5	1537
110 Lapwing, R'Wattled :	65	46	128	41	148	51	125	83	162	77	110	108	78	125	816	531	1.5	1347
111 Weavers, Baya :	1	2	94	34	3	8	13	4						24	111	72	1.5	183
112 Duck, Spotbill :	199	25	128		120	56		70	170	23	26	130	75	142	718	446	1.6	1164
113 Pipits (All) :	22		1	8	11	5	24	15	3			3	1	7	62	38	1.6	100
114 Munia, Red :		6	24		10			19	17	8	7	7	35	12	93	52	1.8	145
115 StoneCurlew :	28	24	50		34	15			18	16		15	1	1	131	71	1.8	202
116 Kites, BlackWing :	5		4	1	5	5	1							2	15	8	1.9	23
117 Warblers (All) :	13	12	29	57	39	39	114	16	46		11	4	5	2	257	130	2.0	387
118 Babbler, L'Grey :	15	41	28	4	29	11	46		56	18	26		46	50	246	124	2.0	370
119 Kestrel :						1	2								2	1	2.0	3
120 Robin, Magpie :	6	3	23	5	26	5	6	2	3	12	9		15	16	88	43	2.0	131
121 Kingfisher, L'blue :			1	1	2		2		2	1				1	7	3	2.3	10
122 Parakeet, Bl'Head :		5	3		1	1			1		7		3		15	6	2.5	21
123 Wagtail, (Uniden.) :	9		6		4	18	25		24		30	25	10		108	43	2.5	151
124 Wagtail, Yellow :	2		6		23	43	29		38		31	5	15		144	48	3.0	192
125 Thrush, BlueRock :					2	1							1		3	1	3.0	4
126 Harrier, Marsh :			1		1	1	1								3	1	3.0	4
127 Quail, Bush :				1			1						2		3	1	3.0	4
128 Parakeet, Alexand. :	2				4				8	2	6	2		2	20	6	3.3	26
129 Stork, Painted :		4	104	7	171	3	21	24	23	3	2	2		1	321	44	7.3	365
130 Sandpiper, Others :							50				35	22	30	9	115	31	3.7	146
131 Lark, Crested :		5	7		24		9	4			2		2	2	44	11	4.0	55
132 Plover, Spurwing :							7	2	1						8	2	4.0	10
133 Plovers, Kentish :							4			2	4				8	2	4.0	10
134 Dabchick :		1	10		6	2	1	2	8	3		5	29		54	13	4.2	67
135 Vulture, Scavenger :	69	5	55		17	9	9		2	5		4	1	11	153	34	4.5	187
136 Sandpiper, Common :	6		10		16	1	6	6	7	1	8	2	8	2	61	12	5.1	73
137 Stilt, B'Winged :			33		17				82		52		45	45	229	45	5.1	274
138 Shrike, Grey :	5	2	12	2	8	1	3		1				2		31	5	6.2	36
139 Wagtail, Pied :			9	4	18	1	21	4	11	3	4		12		75	12	6.3	87
140 Shrike, Com. Wood :	4		1				3				6			2	14	2	7.0	16
141 Swallow, Common :	14	12	20	14	42	1	68	2	41	5	93	2	36	4	314	40	7.9	354
142 Munia, Spotted :										2			23		23	2	11.5	25
143 Wagtail, Grey :			15		11		4		8		12	5	8		58	5	11.6	63
144 Duck, Brahmini :	10		96		35		5		98		16	7	10		270	7	38.6	277
145 Stint, Little :			44	1	5				44		13		7		113	1	113.0	114
146 Duck, Pintail :	341		630		83			1220		251		701			3226	0 All Wn	3226	
147 Duck, Shoveller :	232		1126		356			275		128		135			2252	0 All Wn	2252	
0 148 Gull, (Uniden.) :			235		163		242		354		204		202		1400	0 All Wn	1400	
149 Duck, Teal, Common :			365		108				277		216		224		1184	0 All Wn	1184	
150 Wagtail, White :	6		42		74		40		43		37		24		266	0 All Wn	266	
0 151 Gulls, Blackheaded :			2								105		71		178	0 All Wn	178	
152 Duck, Poch. Tufted :			12		43						43				98	0 All Wn	98	
153 Duck, Pochard, Com. :			75								11				86	0 All Wn	86	

Table 3 (Contd). THE SEASONAL STATUS OF BIRDS SEEN IN THE DELHI BIRD COUNTS

	Win. Mon. Ratio Total														#'s	#'s	Wn/Mo	#'s
	Wn81	Mo81	Wn82	Mo82	Wn83	Mo83	Wn84	Mo84	Wn85	Mo85	Wn86	Mo86	Wn87	Mo87	116.6	107.6	1.1	224.2
Time per Count (Hours)	11.8	18.1	23.8	15.5	23.4	19.2	22.5	12	13.9	12	11.6	7	9.6	23.6	147	127	1.2	274
Persons Participating	15	24	36	19	31	26	19	8	14	12	13	8	16	30	38	37	1	75
# Of Counts / Season	4	6	7	5	8	8	7	4	4	4	4	2	4	8				
0 154 Redstart	9		8		37		10		7		5		5		81	0	All Wn	81
155 Goose, Greylag					2				56						58	0	All Wn	58
156 BlueThroat	1		4		9		16		8		14		5		57	0	All Wn	57
157 Coot			42												42	0	All Wn	42
158 Avocet									4		30				34	0	All Wn	34
159 Flycatch, R' Breast	5				11		1		4		3		2		26	0	All Wn	26
160 Pelican, Rosy													20		20	0	All Wn	20
161 Lapwing, Y' Wattled	3		5		9										17	0	All Wn	17
162 Duck, Wigeon					10						5				15	0	All Wn	15
163 Duck, Poch. R' Head					14										14	0	All Wn	14
164 Duck, Mallard													11		11	0	All Wn	11
165 Crane, Demoisele													11		11	0	All Wn	11
166 Swallow, Cliff					7										7	0	All Wn	7
167 Flycatch, Fantail											2		3		5	0	All Wn	5
168 Flycatch, Greyhead					2						2				4	0	All Wn	4
169 Stork, Blackneck							3								3	0	All Wn	3
170 Gulls, Brownheaded			2												2	0	All Wn	2
171 Lapwing, W' Tailed									2						2	0	All Wn	2
172 Harrier, Pale							1								1	0	All Wn	1
173 Thrush, B' Throat									1						1	0	All Wn	1
174 Wryneck											1				1	0	All Wn	1
175 Nuthatch C'nut Bell					1										1	0	All Wn	1
176 Eagle, Tawny					1										1	0	All Wn	1
177 Bulbul, W' Browed			21												1	0	All Wn	1



Table 4. THE HABITATS OF DELHI'S BIRDS.

The following table gives the habitats of the birds seen in the counts. Arrangement of birds within each habitat, is in decreasing order of their numbers seen.

		HAB NEST DIET							Win.	Mon.	Ratio	Total
		G	S	G	S	M	A		#'s	#'s	Wn/Mo	#'s
Time for ALL Count		*	*	*	*	*	*		116.6	107.6	1.1	224.2
# Of Counts / Season		*	*	*	*	*	*		38	37	1	75
Habitat A1 (Open water)												
1 Duck, Shoveller	A	1	M	M	3	2		2252	0	All Wn.		2252
2 Duck, Poch. Tufted	A	1	M	M	2	6		98	0	All Wn.		98
3 Duck, Pochard, Com.	A	1	M	M	6	2		86	0	All Wn.		86
4 Terns (All)	A	1	V	V	3	2		23	61	0.4		84
5 Duck, Poch. R' Head	A	1	M	M	6	2		14	0	All Wn.		14
6 Duck, Mallard	A	1	M	M	6	0		11	0	All Wn.		11
Total #'s seen in habitat A2 :								2484	61	40.721		2545
Total Species seen in habitat A2 :								6	1	6		6
Habitat A2 (Water with interspersed reeds)												
7 Duck, Pintail	A	2	M	M	6	0		3226	0	All Wn.		3226
8 Duck, Teal, Common	A	2	M	M	12	6		1184	0	All Wn.		1184
9 Duck, Spotbill	A	2	A	2	6	0		718	446	1.6		1164
10 Duck, Nakta	A	2	A	3	7	8		37	39	1.0		68
11 Dabchick	A	2	A	1	2	3		54	13	4.2		67
12 Coot	A	2	A	2	2	6		42	0	All Wn.		42
13 Duck, Wigeon	A	2	M	M	6	0		15	0	All Wn.		15
14 Duck, Teal, Cotton	A	2	A	3	6	2		0	3	All Mo.		3
Total #'s seen in habitat A2 :								5276	501	10.530		5769
Total Species seen in habitat A2 :								7	4	1.75		8
Habitat A3 (Open water with floating leaves)												
15 Jacana, Phes'tail	A	9	A	1	6	1		0	31	All Mo.		31
16 Jacana, BronzeWing	A	5	A	1	6	1		0	1	All Mo.		1
Habitat A4 (Low vertical banks)												
17 Egret, Little	A	4	A	3	1	3		90	248	0.4		338
18 Heron, Pond	A	4	A	3	3	2		93	192	0.5		285
19 Egret, Large	A	4	A	3	3	1		7	11	0.6		18
Total #'s seen in habitats A3 & A4 :								190	483	0.3933		673
Total Species seen in habitats A3 & A4 :								3	5	0.6		5
Habitat A5 (Shallow sloping shore)												
20 Stilt, B'Winged	A	5	V	V	2	0		229	45	5.1		274
21 Stork, Painted	A	5	A	3	3	0		319	44	13.7		363
22 Sandpiper, Others	A	5	M	M	2	0		115	31	3.7		146
23 Stint, Little	A	5	M	M	2	0		113	1	113.0		114
24 Sandpiper, Common	A	5	M	M	2	0		61	12	5.1		73
25 Avocet	A	5	M	M	2	0		34	0	All Wn.		34
26 Sandpiper, Spotted	A	5	M	M	2	0		5	15	0.3		20
27 Pelican, Rosy	A	5	M	M	3	0		20	0	All Wn.		20
28 Heron, Purple	A	5	A	3	3	0		3	12	0.3		15
29 Sandpiper, Green	A	5	M	M	2	0		3	9	0.3		12
30 Plovers, LitRinged	A	5	A	4	1	2		3	8	0.4		11
31 Crane, Demoisele	A	5	M	M	8	1		11	0	All Wn.		11
32 Plovers, Kentish	A	5	A	4	1	2		2	8	0.3		10

Table 4. (Contd.). THE HABITATS OF DELHI'S BIRDS.

	HAB	NEST	DIET	Win.	Mon.	Ratio	Total			
	G	S	G	S	M	A	#'s	#'s	Wn/Mo	#'s
Time for ALL Count	*	*	*	*	*	*	116.6	107.6	1.1	224.2
# Of Counts / Season	*	*	*	*	*	*	38	37	1	75
<hr/>										
34 Heron, Grey	A	5	A	3	3	0	4	4	1.0	8
35 Ibis, White	A	5	A	3	3	2	0	7	All Mo.	7
36 Stork, Blackneck	A	5	A	3	3	0	3	0	All Wn.	3
Total #'s seen in habitat A5:							933	198	4.7121	1131
Total Species seen in habitat A5:							16	13	1.2307	17
Habitat A6 (Dense reeds & rushes on banks)										
37 Waterhen, W'Breast	A	6	A	2	2	6	35	75		110
38 Moorhen, Indian	A	6	A	2	2	6	18	36	0.5	54
39 Bittern, Little	A	6	A	3	3	0	0	2	All Mo.	2
Habitat A7 (Bushes and trees adjoining bank)										
40 Cormorant (All)	A	7	A	3	3	0	228	480	0.5	708
41 Heron, Night	A	7	A	3	3	2	61	584	0.1	645
42 Kingfish, W'Breast	A	7	A	5	3	1	87	64	1.4	151
43 Kingfisher, Pied	A	7	A	5	3	2	15	17	0.9	32
44 Kingfisher, L'blue	A	7	A	5	3	2	7	3	2.3	10
45 Kingfisher, S'bill	A	7	A	5	3	4	0	2	All Mo.	2
Habitat A8 (Dry slopping shore)										
46 Duck, Brahmini	A	8	M	M	6	2	270	7	38.6	277
47 Plover, Spurwing	A	8	A	4	1	0	8	2	4.0	10
48 Pranticole, Sm. Ind	A	8	A	4	2	6	0	7	All Mo.	7
Habitat A9 (Bushes and reeds adjoining banks)										
49 Munia, Red	A	9	B	9	7	1	93	52	1.8	145
47 Weavers, B'Breast	A	9	A	2	12	1	0	60	All Mon	60
51 BlueThroat	A	9	M	M	1	0	57	0	All Wn.	57
52 Weavers, Streaked	A	9	A	2	12	1	0	22	All Mon	22
53 Munia, Blackheaded	A	9	B	9	7	1	0	16	All Mon	16
54 Bushchat, Collared	A	9	M	M	1	0	6	7	0.9	13
Total #'s seen in habitat A6 to A9 :							885	1436	0.6162	2321
Total Species seen in habitat A6 TO A9 :							12	17	0.7058	18
Habitat A10 (Open areas of land near water)										
Lapwing, R'Wattled	A	10	A	6	1	2	816	531	1.5	1347
56 Myna, Pied	A	10	B	10	13	1	559	616	0.9	1175
57 Starling	A	10	M	M	1	4	269	192	1.4	461
58 Swallow, Common	A	10	M	M	1	0	314	40	7.9	354
59 Wagtail, White	A	10	M	M	1	0	266	0	All Wn.	266
60 Martin, Sand	A	10	A	5	1	0	18	182	0.1	200
61 Wagtail, Yellow	A	10	M	M	1	0	144	48	3.0	192
62 Wagtail, (Uniden.)	A	10	M	M	1	0	108	43	2.5	151
63 Wagtail, Pied	A	10	C	12	1	0	75	12	6.3	87
64 Wagtail, Grey	A	10	M	M	1	0	58	5	11.6	63
65 Goose, Greylag	A	10	M	M	8	0	58	0	All Wn.	58
66 Swallow, WireTail	A	10	C	12	1	0	11	18	0.6	29
67 Swallow, RedRump	A	10	C	12	1	0	10	16	0.6	26
68 Goose, Barheaded	A	10	M	M	8	0	4	7	0.6	11
69 Swallow, Cliff	A	10	C	12	1	0	7	0	All Wn.	7
70 Harrier, Marsh	A	10	M	M	4	2	3	1	3.0	4
71 Lapwing, W'Tailed	A	10	A	4	2	0	2	0	All Wn.	2
Total #'s seen in habitat A10 :							2722	1711	1.5908	4433
Total Species seen in habitat A10 :							12	13	0.9230	17
<hr/>										
Total #'s seen ALL water related habitats :							12490	4390	2.8451	16872
Species seen in all water related habitats :							56	53	1.0566	71



Table 4 (Contd.). THE HABITATS OF DELHI'S BIRDS.

	HAB	NEST	DIET	Win.	Mon.	Ratio	Total				
	G	S	G	S	M	A	#'s	#'s	Wn/Mo	#'s	
Time for ALL Count	*	*	*	*	*	*	116.6	107.6	1.1	224.2	
# Of Counts / Season	*	*	*	*	*	*	38	37	1	75	
-----											
0	Habitat B11 (Thorn scrub and grass jungle)										
72	Babbler, Yel'eyed	B	11	B	9	1	9	13	9	1.4	22
73	Quail, Bush	B	11	B	8	7	1	3	1	3.0	4
	Total #'s seen in habitat B11 :							16	10	1.6	26
	Total Species seen in habitat B11 :							2	2	1	2
-----											
	Habitat B12 (Dry, rocky, with bushes and few trees)										
74	Dove, Ringed	B	12	B	10	7	12	328	643	0.5	971
75	Dove, Lit. Brown	B	12	B	10	7	12	311	432	0.7	743
76	Babbler, Common	B	12	B	9	1	9	322	388	0.8	710
77	Robin, Indian	B	12	B	7	1	0	275	286	1.0	561
78	Bulbul, W'Cheek	B	12	B	10	9	1	68	128	0.5	196
79	WrenWarb, Indian	B	12	B	8	1	0	102	70	1.5	172
80	Lark, Others	B	12	B	7	7	1	71	69	1.0	140
81	WrenWarb, Others	B	12	V	V	1	0	20	100	0.2	120
82	Shrike, BayBacked	B	12	B	10	1	4	38	70	0.5	108
83	Lark, Crested	B	12	B	7	7	1	44	11	4.0	55
84	Shrike, Grey	B	12	B	10	1	4	31	5	6.2	36
85	Babbler, Striated	B	12	B	9	1	9	11	13	0.8	24
86	Kites, BlackWing	B	12	B	11	1	4	15	8	1.9	23
87	Lark, R'WingBush	B	12	B	7	7	1	1	20	0.1	21
88	Owl, Great Horned	B	12	B	7	4	3	7	5	1.4	12
89	BeeEater, Bluetail	B	12	B	5	1	0	0	12	All Mon	12
90	Shikra	B	12	B	11	4	0	0	6	All Mo.	6
91	Nightjar	B	12	B	10	1	0	0	4	All Mon	4
92	Kestrel	B	12	M	M	4	0	2	1	2.0	3
93	Cuckoo, Sirkeer	B	12	B	9	4	9	1	1	1.0	2
94	Bulbul, W'Browed	B	12	B	10	9	1	1	0	All Wn.	1
95	Buzzard, WhiteEyed	B	12	B	11	1	4	0	1	All Mo.	1
96	Eagle, Tawny	B	12	B	11	5	4	1	0	All Wn.	1
	Total #'s seen in habitat B12 :							1649	2273	0.7254	3922
	Total Species seen in habitat B12 :							19	21	0.9047	23
-----											
	Habitat B13 (Short trees with bushy undergrowth)										
97	Warblers(All)	B	13	V	V	1	0	257	130	2.0	387
98	WrenWarblers, Ashy	B	13	B	9	1	0	97	177	0.5	274
99	Peafowl	B	13	B	8	8	4	91	178	0.5	269
100	Partridge, Grey	B	13	B	8	7	1	55	93	0.6	148
101	Partridge, Black	B	13	B	8	7	1	8	89	0.1	97
102	Shrike, Rfs' Backed	B	13	B	10	1	4	47	45	1.0	92
103	Minivet, Scarlet	B	13	B	11	1	0	31	47	0.7	78
104	TreePie	B	13	B	11	11	4	21	50	0.4	71
105	Bulbul, R'Whisker	B	13	B	10	1	9	33	32	1.0	65
106	Crowpheasant	B	13	B	9	1	4	29	26	1.1	55
107	Cuckoo, PiedCrest	B	13	B	9	1	9	4	27	0.1	31
108	Parakeet, Bl'Head	B	13	B	10	11	12	15	6	2.5	21
109	Shrike, Com. Wood	B	13	B	10	1	0	14	2	7.0	16
110	Owlet, Spotted	B	13	B	11	1	4	4	7	0.6	11
111	Woodpeck, Mahratta	B	13	B	10	1	0	1	9	0.1	10
112	Minivet, Small	B	13	B	11	1	0	3	5	0.6	8
113	CuckooShrikeLarge	B	13	B	11	1	9	0	3	All Mon	3
114	Cuckoo, Plaintive	B	13	B	9	1	9	0	3	All Mon	3

Table 4 (Contd.). THE HABITATS OF DELHI'S BIRDS.

	HAB	NEST	DIET	Win.	Mon.	Ratio	Total
	G	S	G	S	M	A	#'s
Time for ALL Count	*	*	*	*	*	*	116.6
# Of Counts / Season	*	*	*	*	*	*	38
							107.6
							1.1
							224.2
							1
							75
o 115 NuthatchC'nutBell	B	13	B	9	1	0	1
116 Wryneck	B	13	B	10	1	0	1
Total #'s seen in habitat B13 :							712
Total Species seen in habitat B13 :							18
							18
							1
							20
Habitat B14 (Open areas, few trees, possible cultivation)							
117 Vulture, W'Backed	B	14	B	11	5	0	359
118 RosyPastor	B	14	M	M	12	8	0
119 Egret, Cattle	B	14	A	3	1	3	178
120 BeeEater, Green	B	14	B	5	1	0	146
121 Babbler, L'Grey	B	14	B	10	1	9	246
122 Myna, Brahmini	B	14	C	12	9	1	182
123 Drongo, Black	B	14	B	11	1	10	85
124 Munia, W'Throated	B	14	B	9	7	0	122
125 Bushchat, Pied	B	14	M	M	1	0	61
126 StoneCurlew	B	14	A	4	1	4	131
127 Weavers, Baya	B	14	A	3	12	1	111
128 Pipits(All)	B	14	B	7	1	0	62
129 Crow, Jungle	B	14	B	11	4	5	15
130 Vulture, LongBill	B	14	B	11	5	0	15
131 Roller, Indian	B	14	B	10	1	4	18
132 Munia, Spotted	B	14	B	9	7	1	23
133 Lapwing, Y'Wattled	B	14	A	6	1	2	17
134 Dove, R'Turtle	B	14	B	10	7	12	4
135 Munia, W'Backed	B	14	B	9	7	0	0
136 Vulture, King	B	14	B	11	5	0	1
137 Dove, Spotted	B	14	B	10	7	12	1
138 Harrier, Pale	B	14	M	M	4	0	1
Total #'s seen in habitat B14 :							1778
Total Species seen in habitat B14 :							20
							20
							1
							22
Total #'s seen in ridge related habitats :							4155
Total Species seen in ridge related habitats :							59
							6178
							61
							10333
							67
Habitat C15 (Garden, with few trees and bushes)							
139 Bulbul, Redvented	C	15	B	10	1	9	803
140 Parakeet, RoseRing	C	15	B	10	11	12	918
141 Babbler, Jungle	C	15	B	9	1	9	397
142 Hoopoe	C	15	C	12	1	0	241
143 Sunbird, Purple	C	15	B	10	10	1	132
144 Robin, Magpie	C	15	B	10	1	10	88
145 Barbet, Crim. Breas	C	15	B	10	9	1	14
146 Tailor Bird	C	15	B	9	1	10	63
147 Redstart	C	15	M	M	1	0	81
148 Flycatch, R'Breast	C	15	M	M	1	0	26
149 Parakeet, Alexand.	C	15	B	11	11	12	20
150 Flycatch, Fantail	C	15	B	10	1	0	5
151 Flycatch, Greyhead	C	15	M	M	1	0	4
152 Sunbird, P'Rumped	C	15	B	10	10	1	0
Total #'s seen in habitat C15 :							2792
Total Species seen in habitat C15 :							13
							10
							1.3
							14



Table 4 (Contd.). THE HABITATS OF DELHI'S BIRDS.

		HAB NEST DIET							Win.	Mon.	Ratio	Total				
		G	S	G	S	M	A		#'s	#'s	Wn/Mo	#'s				
Time for ALL Count		*	*	*	*	*	*		116.6	107.6	1.1	224.2				
# Of Counts / Season		*	*	*	*	*	*		38	37	1	75				
<hr/>																
0	Habitat C16 (Garden habitat with groves of tall trees)															
153	Pigeon, Green	C	16	B	10	9	1		37	63	0.6	100				
154	Iora	C	16	B	11	1	0		35	64	0.5	99				
155	WhiteEye	C	16	B	10	1	9		44	46	1.0	90				
156	Koel	C	16	B	11	9	1		16	52	0.3	68				
157	Oriole, Golden	C	16	B	10	1	9		0	59	All Mon	59				
158	Woodpecker, G'Back	C	16	B	11	1	8		12	22	0.5	34				
159	Barbet, L'Green	C	16	B	10	9	1		5	26	0.2	31				
160	Hornbill, Grey	C	16	B	11	9	4		6	18	0.3	24				
161	Cuckoo, IndianHawk	C	16	B	9	1	9		1	11	0.1	12				
	Total #'s seen in habitat C16 :								156	361	0.4321	517				
	Total Species seen in habitat C16 :								8	9	0.8888	9				
 Habitat C17 (Monuments and old buildings)																
162	Swift, House	C	17	C	12	1	0		81	219	0.4	300				
163	Martin, DuskyCrag	C	17	C	12	1	0		8	43	0.2	51				
164	Chat, BrownRock	C	17	C	12	1	0		7	19	0.4	26				
165	Thrush, BlueRock	C	17	M	M	1	9		3	1	3.0	4				
166	Owl, Barn	C	17	C	12	4	0		0	3	All Mo.	3				
167	Thrush, B'Throat	C	17	M	M	1	9		1	0	All Wn.	1				
	Total #'s seen in habitat C17 :								100	285	0.3508	385				
	Total Species seen in habitat C17 :								5	5	1	6				
 Habitat C18 (Commensal with humans)																
168	Pigeon, BlueRock	C	18	C	12	12	0		1811	1872	1.0	3683				
169	Myna, Common	C	18	C	12	13	1		1359	1580	0.9	2939				
170	Crow, House	C	18	B	11	13	4		818	1337	0.6	2155				
171	Sparrow, House	C	18	C	12	12	1		781	812	1.0	1593				
172	Kites, Pariah	C	18	B	11	1	4		725	744	1.0	1469				
173	Gull, (Uniden.)	C	18	M	M	13	1		1400	0	All Wn.	1400				
174	Myna, Bank	C	18	A	5	13	1		344	589	0.6	933				
175	Vulture, Scavenger	C	18	C	12	5	13		153	34	4.5	187				
176	Gulls, Blackheaded	C	18	M	M	13	1		178	0	All Wn.	178				
177	Gulls, Brownheaded	C	18	M	M	13	1		2	0	All Wn.	2				
	Total #'s seen in habitat C18 :								7571	6968	1.0865	14539				
	Total Species seen in habitat C18 :								10	7	1.4285	10				
 Total #s seen in ALL man related habitats :													10619	10187		20805
Species seen in ALL man related habitats :													36	31		39

Table 5. NESTING HABITS OF DELHI'S BIRDS

The following is a table listing the nesting habits of birds identified in the counts. The arrangement of birds nesting in similar sites is in descending order of their total numbers seen.

	HAB NEST DIET						Win.	Mon.	Ratio	Total
	G	S	G	S	M	A	#'s	#'s	Wn/Mo	#'s
Time for Counts(Hours)	*	*	*	*	*	*	116.6	107.6	1.1	224.2
# Of Counts / Season	*	*	*	*	*	*	38	37	1	75
Birds that are known winter migrants (do not breed in Delhi)										
1 Duck, Pintail	A	2	M	M	6	0	3226	0	All Wn	3226
2 Duck, Shoveller	A	1	M	M	3	2	2252	0	All Wn	2252
3 Gull, (Uniden.)	C	18	M	M	13	1	1400	0	All Wn	1400
4 Duck, Teal, Common	A	2	M	M	12	6	1184	0	All Wn	1184
5 Rosy Pastor	B	14	M	M	12	8	0	762	All Mo	762
6 Starling	A	10	M	M	1	4	269	192	1.4	461
7 Swallow, Common	A	10	M	M	1	0	314	40	7.9	354
8 Duck, Brahmini	A	8	M	M	6	2	270	7	38.6	277
9 Wagtail, White	A	10	M	M	1	0	266	0	All Wn	266
10 Bushchat, Pied	B	14	M	M	1	0	61	151	0.4	212
11 Wagtail, Yellow	A	10	M	M	1	0	144	48	3.0	192
12 Gulls, Blackheaded	C	18	M	M	13	1	178	0	All Wn	178
13 Wagtail, (Uniden.)	A	10	M	M	1	0	108	43	2.5	151
14 Sandpiper, Others	A	5	M	M	2	0	115	31	3.7	146
15 Stint, Little	A	5	M	M	2	0	113	1	113.0	114
16 Duck, Poch. Tufted	A	1	M	M	2	6	98	0	All Wn	98
17 Duck, Pochard, Com.	A	1	M	M	6	2	86	0	All Wn	86
18 Redstart	C	15	M	M	1	0	81	0	All Wn	81
19 Sandpiper, Common	A	5	M	M	2	0	61	12	5.1	73
20 Wagtail, Grey	A	10	M	M	1	0	58	5	11.6	63
21 Goose, Greylag	A	10	M	M	8	0	58	0	All Wn	58
22 BlueThroat	A	9	M	M	1	0	57	0	All Wn	57
23 Avocet	A	5	M	M	2	0	34	0	All Wn	34
24 Flycatch, R' Breast	C	15	M	M	1	0	26	0	All Wn	26
25 Pelican, Rosy	A	5	M	M	3	0	20	0	All Wn	20
26 Sandpiper, Spotted	A	5	M	M	2	0	5	15	0.3	20
27 Duck, Wigeon	A	2	M	M	6	0	15	0	All Wn	15
28 Duck, Poch. R' Head	A	1	M	M	6	2	14	0	All Wn	14
29 Bushchat, Collared	A	9	M	M	1	0	6	7	0.9	13
30 Sandpiper, Green	A	5	M	M	2	0	3	9	0.3	12
31 Goose, Barheaded	A	10	M	M	8	0	4	7	0.6	11
32 Crane, Demoisele	A	5	M	M	8	1	11	0	All Wn	11
33 Duck, Mallard	A	1	M	M	6	0	11	0	All Wn	11
34 Sandpiper, R' shank	A	5	M	M	2	0	2	8	0.3	10
35 Harrier, Marsh	A	10	M	M	4	2	3	1	3.0	4
36 Thrush, BlueRock	C	17	M	M	1	9	3	1	3.0	4
37 Flycatch, Greyhead	C	15	M	M	1	0	4	0	All Wn	4
38 Kestrel	B	12	M	M	4	0	2	1	2.0	3
39 Gulls, Brownheaded	C	18	M	M	13	1	2	0	All Wn	2
40 Thrush, B' Throat	C	17	M	M	1	9	1	0	All Wn	1
41 Harrier, Pale	B	14	M	M	4	0	1	0	All Wn	1
Total # of known winter migrants seen :							10566	1341	7.9	11907
Total species of known winter migrants :							40	19		41
Bird groups or species with variable nesting sites.										
42 Warblers(All)	B	13	V	V	1	0	257	130	2.0	387
43 Stilt, B' Winged	A	5	V	V	2	0	229	45	5.1	274



Table 5. NESTING HABITS OF DELHI'S BIRDS.

	HAB NEST DIET						Win. # 's	Mon. # 's	Ratio Wn/Mo	Total # 's
	G	S	G	S	M	A				
Time for Counts(Hours)	*	*	*	*	*	*	116.6	107.6	1.1	224.2
# Of Counts / Season	*	*	*	*	*	*	38	37	1	75
<hr/>										
0 44 WrenWarb, Others	B	12	V	V	1	0	20	100	0.2	120
45 Terns (All)	A	1	V	V	3	2	23	61	0.4	84
Total # of birds with variable nesting :							529	336	1.6	865
Species of birds with variable nesting :							4	4	1.0	4
Nesting site A1 (floating nest on water vegetation)										
46 Dabchick	A	2	A	1	2	3	54	13	4.2	67
47 Jacana, Phes'tail	A	3	A	1	6	1	0	31	All Mo	31
48 Jacana, BronzeWing	A	3	A	1	6	1	0	1	All Mo	1
Nesting site A2 (Reeds on waters edge)										
49 Duck, Spotbill	A	2	A	2	6	0	718	446	1.6	1164
50 Waterhen, W'Breast	A	6	A	2	2	6	35	75	0.5	110
51 Weavers, B'Breast	A	9	A	2	12	1	0	60	All Mo	60
52 Moorhen, Indian	A	6	A	2	2	6	18	36	0.5	54
53 Coot	A	2	A	2	2	6	42	0	All Wn	42
54 Weavers, Streaked	A	9	A	2	12	1	0	22	All Mo	22
Total number nesting in site A2 :							867	684	1.3	1551
Total species nesting in site A2 :							6	8	0.8	9
Nesting site A3 (Trees in vicinity of water)										
55 Cormorant (All)	A	7	A	3	3	0	228	480	0.5	708
56 Heron, Night	A	7	A	3	3	2	61	584	0.1	645
57 Egret, Cattle	B	14	A	3	1	3	178	427	0.4	605
58 Egret, Little	A	4	A	3	1	3	90	248	0.4	338
59 Heron, Pond	A	4	A	3	3	2	93	192	0.5	285
60 Stork, Painted	A	5	A	3	3	0	319	44	7.6	363
61 Weavers, Baya	B	14	A	3	12	1	111	72	1.5	183
62 Duck, Nakta	A	2	A	3	7	8	37	39	1.0	76
63 Egret, Large	A	4	A	3	3	1	7	11	0.6	18
64 Heron, Purple	A	5	A	3	3	0	3	12	0.3	15
65 Heron, Grey	A	5	A	3	3	0	4	4	1.0	8
66 Ibis, White	A	5	A	3	3	2	0	7	All Mo	7
67 Duck, Teal, Cotton	A	2	A	3	6	2	0	3	All Mo	3
68 Stork, Blackneck	A	5	A	3	3	0	3	0	All Wn	3
69 Bittern, Little	A	6	A	3	3	0	0	2	All Mo	2
Total number nesting in site A5 :							1134	2125	0.5	3259
Total species nesting in site A5 :							12	14	0.9	15
Nesting site A4 (Dry river beds)										
70 StoneCurlew	B	14	A	4	1	4	131	71	1.8	202
71 Plovers, L'Ringed	A	5	A	4	1	2	3	8	0.4	11
72 Plovers, Kentish	A	5	A	4	1	2	8	2	4.0	10
73 Plover, Spurwing	A	8	A	4	1	0	8	2	4.0	10
74 Franticole, Sm. Ind	A	8	A	4	2	6	0	7	All Mo	7
75 Lapwing, W'Tailed	A	10	A	4	2	0	2	0	All Wn	2
76 Myna, Bank	C	18	A	5	13	1	344	589	0.6	933
Nesting site A5 (Holes in banks of river or pond)										
77 BeeEater, Green	B	14	B	5	1	0	146	322	0.5	468
78 Martin, Sand	A	10	A	5	1	0	18	182	0.1	200
79 Kingfish, W'Breast	A	7	A	5	3	1	87	64	1.4	151
80 Kingfisher, Pied	A	7	A	5	3	2	15	17	0.9	32

Table 5 (Contd). NESTING HABITS OF DELHI'S BIRDS.

		HAB NEST DIET						Win.	Mon.	Ratio	Total
		G	S	G	S	M	A	#'s	#'s	Wn/Mo	#'s
Time for Counts(Hours)		*	*	*	*	*	*	116.6	107.6	1.1	224.2
# Of Counts / Season		*	*	*	*	*	*	38	37	1	75
<hr/>											
0 81	BeeEater,Bluetail	B	12	B	5	1	0	0	12	All Mo	12
82	Kingfisher,L'blue	A	7	A	5	3	2	7	3	2.3	10
83	Kingfisher,S'bill	A	7	A	5	3	4	0	2	All Mo	2
Total number nesting in sites A4 & A5 :								769	1281	0.6	2050
Total species nesting in sites A4 & A5 :								12	14	0.9	14
<hr/>											
Total number nesting in water related sites :								2770	4090		6860
Total species nesting in water related sites :								30	36		38
<hr/>											
Nesting site B6 (Open wasteland)											
84	Lapwing,R'Wattled	A	10	B	6	1	2	816	531	1.5	1347
85	Lapwing,Y'Wattled	B	14	B	6	1	2	17	0	All Wn	17
Nesting site B7 (Scub country with stones, small trees)											
86	Robin,Indian	B	12	B	7	1	0	275	286	1.0	561
87	Lark,Others	B	12	B	7	7	1	71	69	1.0	140
88	Pipits(All)	B	14	B	7	1	0	62	38	1.6	100
89	Lark,Crested	B	12	B	7	7	1	44	11	4.0	55
90	Lark,R'WingBush	B	12	B	7	7	1	1	20	0.1	21
91	Owl,Great Horned	B	12	B	7	4	3	7	5	1.4	12
Nesting site B8 (Tamrisk scrub with few bushes)											
92	Peafowl	B	13	B	8	8	4	91	178	0.5	269
93	WrenWarb,Indian	B	12	B	8	1	0	102	70	1.5	172
94	Partridge,Grey	B	13	B	8	7	1	55	93	0.6	148
95	Partridge,Black	B	13	B	8	7	1	8	89	0.1	97
96	Quail,Bush	B	11	B	8	7	1	3	1	3.0	4
Total birds nesting in sites B6, B7 & B8								1552	1391	1.1	2943
Total species nesting in sites B6, B7 & B8								13	12	1.1	13
<hr/>											
Nesting site B9 (Thorny bushes)											
97	Babbler,Jungle	C	15	B	9	1	9	397	449	0.9	846
98	Babbler,Common	B	12	B	9	1	9	322	388	0.8	710
99	WrenWarblers,Ashy	B	13	B	9	1	0	97	177	0.5	274
100	Munia, W'Throated	B	14	B	9	7	0	122	103	1.2	225
101	Munia, Red	A	9	B	9	7	1	93	52	1.8	145
102	Tailor Bird	C	15	B	9	1	10	63	55	1.1	118
103	Crowpheasant	B	13	B	9	1	4	29	26	1.1	55
104	Cuckoo,PiedCrest	B	13	B	9	1	9	4	27	0.1	31
105	Munia, Spotted	B	14	B	9	7	1	23	2	11.5	25
106	Babbler,Striated	B	12	B	9	1	9	11	13	0.8	24
107	Babbler,Yel'eyed	B	11	B	9	1	9	13	9	1.4	22
108	Munia,Blackheaded	A	9	B	9	7	1	0	16	All Mo	16
109	Cuckoo,IndianHawk	C	16	B	9	1	9	1	11	0.1	12
110	Munia, W'Backed	B	14	B	9	7	0	0	6	All Mo	6
111	Cuckoo,Plaintive	B	13	B	9	1	9	0	3	All Mo	3
112	Cuckoo,Sirkeer	B	12	B	9	4	9	1	1	1.0	2
113	NuthatchC'nutBell	B	13	B	9	1	0	1	0	All Wn	1
Total number nesting in site B9 :								1177	1338	0.9	2515
Total species nesting in site B9 :								14	16	0.9	17



Table 5 (Contd). NESTING HABITS OF DELHI'S BIRDS.

		HAB NEST DIET						Win. # 's	Mon. # 's	Ratio Wn/Mo	Total # 's
		G	S	G	S	M	A				
Time for Counts (Hours)		*	*	*	*	*	*	116.6	107.6	1.1	224.2
# Of Counts / Season		*	*	*	*	*	*	38	37	1	75
Nesting site B10 (Low trees)											
114	Bulbul, Redvented	C	15	B	10	1	9	803	874	0.9	1677
115	Parakeet, Rose Ring	C	15	B	10	11	12	918	619	1.5	1537
116	Myna, Pied	A	10	B	10	13	1	559	616	0.9	1175
117	Dove, Ringed	B	12	B	10	7	12	328	643	0.5	971
118	Dove, Lit. Brown	B	12	B	10	7	12	311	432	0.7	743
119	Babbler, L' Grey	B	14	B	10	1	9	246	124	2.0	370
120	Sunbird, Purple	C	15	B	10	10	1	132	219	0.6	351
121	Bulbul, W' Cheek	B	12	B	10	9	1	68	128	0.5	196
122	Robin, Magpie	C	15	B	10	1	10	88	43	2.0	131
123	Barbet, Crim. Breas	C	15	B	10	9	1	14	111	0.1	125
124	Shrike, Bay Backed	B	12	B	10	1	4	38	70	0.5	108
125	Pigeon, Green	C	16	B	10	9	1	37	63	0.6	100
126	Shrike, Rfs' Backed	B	13	B	10	1	4	47	45	1.0	92
127	White Eye	C	16	B	10	1	9	44	46	1.0	90
128	Bulbul, R' Whisker	B	13	B	10	1	9	33	32	1.0	65
129	Oriole, Golden	C	16	B	10	1	9	0	59	All Mo	59
130	Shrike, Grey	B	12	B	10	1	4	31	5	6.2	36
131	Roller, Indian	B	14	B	10	1	4	18	17	1.1	35
132	Barbet, L' Green	C	16	B	10	9	1	5	26	0.2	31
133	Parakeet, Bl' Head	B	13	B	10	11	12	15	6	2.5	21
134	Shrike, Com. Wood	B	13	B	10	1	0	14	2	7.0	16
135	Dove, R' Turtle	B	14	B	10	7	12	4	11	0.4	15
136	Woodpeck, Mahratta	B	13	B	10	1	0	1	9	0.1	10
137	Flycatch, Fantail	C	15	B	10	1	0	5	0	All Wn	5
138	Dove, Spotted	B	14	B	10	7	12	1	3	0.3	4
139	Nightjar	B	12	B	10	1	0	0	4	All Mo	4
140	Bulbul, W' Browed	B	12	B	10	9	1	1	0	All Wn	1
141	Wryneck	B	13	B	10	1	0	1	0	All Wn	1
142	Sunbird, P' Rumped	C	15	B	10	10	1	0	1	All Mo	1
Total number nesting in site B10 :								3762	4208	0.9	7970
Total species nesting in site B10 :								26	26	1.0	29
Nesting site B11 (Tall trees)											
143	Crow, House	C	18	B	11	13	4	818	1337	0.6	2155
144	Kites, Pariah	C	18	B	11	1	4	725	744	1.0	1469
145	Vulture, W' Backed	B	14	B	11	5	0	359	427	0.8	786
146	Drongo, Black	B	14	B	11	1	10	85	208	0.4	293
147	Iora	C	16	B	11	1	0	35	64	0.5	99
148	Minivet, Scarlet	B	13	B	11	1	0	31	47	0.7	78
149	Tree Pie	B	13	B	11	11	4	21	50	0.4	71
150	Koel	C	16	B	11	9	1	16	52	0.3	68
151	Crow, Jungle	B	14	B	11	4	5	15	29	0.5	44
152	Vulture, Long Bill	B	14	B	11	5	0	15	22	0.7	37
153	Woodpecker, G' Back	C	16	B	11	1	8	12	22	0.5	34
154	Parakeet, Alexand.	C	15	B	11	11	12	20	6	3.3	26
155	Hornbill, Grey	C	16	B	11	9	4	6	18	0.3	24

Table 5 (Contd). NESTING HABITS OF DELHI'S BIRDS.

	HAB NEST DIET						Win.	Mon.	Ratio	Total
	G	S	G	S	M	A	#'s	#'s	Wn/Mo	#'s
Time for Counts(Hours)	*	*	*	*	*	*	116.6	107.6	1.1	224.2
# Of Counts / Season	*	*	*	*	*	*	38	37	1	75
-----										
0 156 Kites,BlackWing	B	12	B	11	1	4	15	8	1.9	23
157 Owlet,Spotted	B	13	B	11	1	4	4	7	0.6	11
158 Minivet,Small	B	13	B	11	1	0	3	5	0.6	8
159 Shikra	B	12	B	11	4	0	0	6	All Mo	6
160 Vulture,King	B	14	B	11	5	0	1	3	0.3	4
161 CuckooShrikeLarge	B	13	B	11	1	9	0	3	All Mo	3
162 Buzzard,WhiteEyed	B	12	B	11	1	4	0	1	All Mo	1
163 Eagle,Tawny	B	12	B	11	5	4	1	0	All Wn	1
Total number nesting in site B11 :							2182	3059	0.7	5241
Total species nesting in site B11 :							20	20	1.0	21
-----										
Total number nesting in land related sites :							8673	9996		18669
Total species nesting in land related sites :							73	74		80
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Nesting site C12 (Monuments, buildings, bridges, etc.)										
164 Pigeon,BlueRock	C	18	C	12	12	0	1811	1872	1.0	3683
165 Myna,Common	C	18	C	12	13	1	1359	1580	0.9	2939
166 Sparrow,House	C	18	C	12	12	1	781	812	1.0	1593
167 Hoopoe	C	15	C	12	1	0	241	196	1.2	437
168 Myna,Brahmini	B	14	C	12	9	1	182	168	1.1	350
169 Swift,House	C	17	C	12	1	0	81	219	0.4	300
170 Vulture,Scavenger	C	18	C	12	5	13	153	34	4.5	187
171 Wagtail,Pied	A	10	C	12	1	0	75	12	6.3	87
172 Martin,DuskyCrag	C	17	C	12	1	0	8	43	0.2	51
173 Swallow,WireTail	A	10	C	12	1	0	11	18	0.6	29
174 Swallow,RedRump	A	10	C	12	1	0	10	16	0.6	26
175 Chat,BrownRock	C	17	C	12	1	0	7	19	0.4	26
176 Swallow,Cliff	A	10	C	12	1	0	7	0	All Wn	7
177 Owl,Barn	C	17	C	12	4	0	0	3	All Mo	3
Total number nesting in site B12 :							4726	4992	0.9	9718
Total species nesting in site B12 :							13	13	1.0	14
-----										
Number of birds with nesting potential in Delhi :										35247
Number of known migrants/birds with variable nesting :										12772
-----										
Number of species with nesting potential in Delhi :										132
Number of known winter migrants to Delhi :										41
Number of species and groups with variable nesting :										4



Table 6. THE DIETARY HABITS OF DELHI'S BIRDS.

The following table lists the birds seen in the counts according to their main diet consumed. Birds with the same main diet are then arranged according to the associated diet they eat.

Time for Counts (Hours) Of Counts / Season	HAB NEST DIET						Win.	Mon.	Ratio	Total
	G	S	G	S	M	A	#'s	#'s	Wn/Mo	#'s
	*	*	*	*	*	*	116.6	107.6	1.1	224.2
	*	*	*	*	*	*	38	37	1	75
Birds consuming main diet #1 (Insects)										
1 Plover, Spurwing	A	8	A	4	1	0	8	2	4.0	10
2 BlueThroat	A	9	M	M	1	0	57	0	All Wn	57
3 Bushchat, Collared	A	9	M	M	1	0	6	7	0.9	13
4 Martin, Sand	A	10	A	5	1	0	18	182	0.1	200
5 Swallow, Cliff	A	10	C	12	1	0	7	0	All Wn	7
6 Swallow, Common	A	10	M	M	1	0	314	40	7.9	354
7 Swallow, RedRump	A	10	C	12	1	0	10	16	0.6	26
8 Swallow, WireTail	A	10	C	12	1	0	11	18	0.6	29
9 Wagtail, Grey	A	10	M	M	1	0	58	5	11.6	63
10 Wagtail, Pied	A	10	C	12	1	0	75	12	6.3	87
11 Wagtail, White	A	10	M	M	1	0	266	0	All Wn	266
12 Wagtail, Yellow	A	10	M	M	1	0	144	48	3.0	192
13 Wagtail, (Uniden.)	A	10	M	M	1	0	108	43	2.5	151
14 BeeEater, Bluetail	B	12	B	5	1	0	0	12	All Mo	12
15 Nightjar	B	12	B	10	1	0	0	4	All Mo	4
16 Robin, Indian	B	12	B	7	1	0	275	286	1.0	561
17 WrenWarb, Indian	B	12	B	8	1	0	102	70	1.5	172
18 WrenWarb, Others	B	12	V	V	1	0	20	100	0.2	120
19 Minivet, Scarlet	B	13	B	11	1	0	31	47	0.7	78
20 Minivet, Small	B	13	B	11	1	0	3	5	0.6	8
21 NuthatchC'nutBell	B	13	B	9	1	0	1	0	All Wn	1
22 Shrike, Com. Wood	B	13	B	10	1	0	14	2	7.0	16
23 Warblers (All)	B	13	V	V	1	0	257	130	2.0	387
24 Woodpeck, Mahratta	B	13	B	10	1	0	1	9	0.1	10
25 WrenWarblers, Ashy	B	13	B	9	1	0	97	177	0.5	274
26 Wryneck	B	13	B	10	1	0	1	0	All Wn	1
27 BeeEater, Green	B	14	B	5	1	0	146	322	0.5	468
28 Bushchat, Pied	B	14	M	M	1	0	61	151	0.4	212
29 Pipits (All)	B	14	B	7	1	0	62	38	1.6	100
30 Flycatch, Fantail	C	15	B	10	1	0	5	0	All Wn	5
31 Flycatch, Greyhead	C	15	M	M	1	0	4	0	All Wn	4
32 Flycatch, R' Breast	C	15	M	M	1	0	26	0	All Wn	26
33 Hoopoe	C	15	C	12	1	0	241	196	1.2	437
34 Redstart	C	15	M	M	1	0	81	0	All Wn	81
35 Iora	C	16	B	11	1	0	35	64	0.5	99
36 Chat, BrownRock	C	17	C	12	1	0	7	19	0.4	26
37 Martin, DuskyCrag	C	17	C	12	1	0	8	43	0.2	51
38 Swift, House	C	17	C	12	1	0	81	219	0.4	300
39 Lapwing, Y' Wattled	B	14	A	6	1	2	17	0	All Wn	17
40 Plovers, Kentish	A	5	A	4	1	2	8	2	4.0	10
41 Plovers, L' Ringed	A	5	A	4	1	2	3	8	0.4	11
42 Lapwing, R' Wattled	A	10	A	6	1	2	816	531	1.5	1347
43 Egret, Cattle	B	14	A	3	1	3	178	427	0.4	605
44 Egret, Little	A	4	A	3	1	3	90	248	0.4	338
45 Kites, Pariah	C	18	B	11	1	4	725	744	1.0	1469
46 Roller, Indian	B	14	B	10	1	4	18	17	1.1	35
47 Shrike, BayBacked	B	12	B	10	1	4	38	70	0.5	108

Table 6 (Contd.) THE DIETARY HABITS OF DELHI'S BIRDS.

Time for Counts (Hours)	HAB NEST DIET						Win.	Mon.	Ratio	Total
	G	S	G	S	M	A	#'s	#'s	Wn/Mo	#'s
# Of Counts / Season	*	*	*	*	*	*	116.6	107.6	1.1	224.2
	*	*	*	*	*	*	38	37	1	75
0 48 Buzzard, White Eyed	B	12	B	11	1	4	0	1	All Mo	1
49 Starling	A	10	M	M	1	4	269	192	1.4	461
50 Shrike, Rfs' Backed	B	13	B	10	1	4	47	45	1.0	92
51 Shrike, Grey	B	12	B	10	1	4	31	5	6.2	36
52 Kites, Black Wing	B	12	B	11	1	4	15	8	1.9	23
53 Owllet, Spotted	B	13	B	11	1	4	4	7	0.6	11
54 Crowpheasant	B	13	B	9	1	4	29	26	1.1	55
55 Stone Curlew	B	14	A	4	1	4	131	71	1.8	202
56 Woodpecker, G' Back	C	16	B	11	1	8	12	22	0.5	34
57 Bulbul, R' Whisker	B	13	B	10	1	9	33	32	1.0	65
58 Thrush, Blue Rock	C	17	M	M	1	9	3	1	3.0	4
59 Babbler, L' Grey	B	14	B	10	1	9	246	124	2.0	370
60 Thrush, B' Throat	C	17	M	M	1	9	1	0	All Wn	1
61 Babbler, Common	B	12	B	9	1	9	322	388	0.8	710
62 Babbler, Yel' eyed	B	11	B	9	1	9	13	9	1.4	22
63 Cuckoo Shrike Large	B	13	B	11	1	9	0	3	All Mo	3
64 Bulbul, Red vented	C	15	B	10	1	9	803	874	0.9	1677
65 Cuckoo, Pied Crest	B	13	B	9	1	9	4	27	0.1	31
66 White Eye	C	16	B	10	1	9	44	46	1.0	90
67 Babbler, Striated	B	12	B	9	1	9	11	13	0.8	24
68 Cuckoo, Indian Hawk	C	16	B	9	1	9	1	11	0.1	12
69 Babbler, Jungle	C	15	B	9	1	9	397	449	0.9	846
70 Oriole, Golden	C	16	B	10	1	9	0	59	All Mo	59
71 Cuckoo, Plaintive	B	13	B	9	1	9	0	3	All Mo	3
72 Drongo, Black	B	14	B	11	1	10	85	208	0.4	293
73 Tailor Bird	C	15	B	9	1	10	63	55	1.1	118
74 Robin, Magpie	C	15	B	10	1	10	88	43	2.0	131
Number of birds consuming diet #1 :							7186	7036	1.0	14222
Number of species consuming diet #1 :							68	64	1.0	74
Birds consuming main diet #2 (water insects, crustacea, etc.)										
75 Sandpiper, R' shank	A	5	M	M	2	0	2	8	0.3	10
76 Sandpiper, Spotted	A	5	M	M	2	0	5	15	0.3	20
77 Stilt, B' Winged	A	5	V	V	2	0	229	45	5.1	274
78 Sandpiper, Green	A	5	M	M	2	0	3	9	0.3	12
79 Sandpiper, Common	A	5	M	M	2	0	61	12	5.1	73
80 Lapwing, W' Tailed	A	10	A	4	2	0	2	0	All Wn	2
81 Stint, Little	A	5	M	M	2	0	113	1	113.0	114
82 Sandpiper, Others	A	5	M	M	2	0	115	31	3.7	146
83 Avocet	A	5	M	M	2	0	34	0	All Wn	34
84 Dabchick	A	2	A	1	2	3	54	13	4.2	67
85 Coot	A	2	A	2	2	6	42	0	All Wn	42
86 Moorhen, Indian	A	6	A	2	2	6	18	36	0.5	54
87 Franticole, Sm. Ind	A	8	A	4	2	6	0	7	All Mo	7
88 Duck, Poch. Tufted	A	1	M	M	2	6	98	0	All Wn	98
89 Waterhen, W' Breast	A	6	A	2	2	6	35	75	0.5	110
Number of birds consuming diet #2 :							811	252	1.0	1063
Number of species consuming diet #2 :							14	11	1.1	15



Table 6 (contd.) THE DIETARY HABITS OF DELHI'S BIRDS

	HAB NEST DIET						Win.	Mon.	Ratio	Total
	G	S	G	S	M	A	#'s	#'s	Wn/Mo	#'s
Time for Counts(Hours)	*	*	*	*	*	*	116.6	107.6	1.1	224.2
# Of Counts / Season	*	*	*	*	*	*	38	37	1	75

## 0 Birds consuming main diet #3 (fish, frogs, etc.)

90 Heron, Grey	A	5	A	3	3	0	4	4	1.0	8
91 Pelican, Rosy	A	5	M	M	3	0	20	0	All Wn	20
92 Stork, Blackneck	A	5	A	3	3	0	3	0	All Wn	3
93 Stork, Painted	A	5	A	3	3	0	319	44	7.3	363
94 Heron, Purple	A	5	A	3	3	0	3	12	0.3	15
95 Bittern, Little	A	6	A	3	3	0	0	2	All Mo	2
96 Cormorant (All)	A	7	A	3	3	0	228	480	0.5	708
97 Kingfish, W' Breast	A	7	A	5	3	1	87	64	1.4	151
98 Egret, Large	A	4	A	3	3	1	7	11	0.6	18
99 Duck, Shoveller	A	1	M	M	3	2	2252	0	All Wn	2252
100 Kingfisher, L' blue	A	7	A	5	3	2	7	3	2.3	10
101 Heron, Night	A	7	A	3	3	2	61	584	0.1	645
102 Ibis, White	A	5	A	3	3	2	0	7	All Mo	7
103 Heron, Pond	A	4	A	3	3	2	93	192	0.5	285
104 Terns (All)	A	1	V	V	3	2	23	61	0.4	84
105 Kingfisher, Pied	A	7	A	5	3	2	15	17	0.9	32
106 Harrier, Marsh	A	10	M	M	3	4	3	1	3.0	4
107 Kingfisher, S' bill	A	7	A	5	3	4	0	2	All Mo	2
Number of birds consuming diet #3 :							3125	1484	2.1	4609
Number of species consuming diet #3 :							15	15	1.0	18

## Birds consuming main diet #4 (small mammals, birds, etc.)

108 Shikra	B	12	B	11	4	0	0	6	All Mo	6
109 Harrier, Pale	B	14	M	M	4	0	1	0	All Wn	1
110 Owl, Barn	C	17	C	12	4	0	0	3	All Mo	3
111 Kestrel	B	12	M	M	4	0	2	1	2.0	3
112 Owl, Great Horned	B	12	B	7	4	3	7	5	1.4	12
113 Crow, Jungle	B	14	B	11	4	5	15	29	0.5	44
114 Cuckoo, Sirkeer	B	12	B	9	4	9	1	1	1.0	2
Number of birds consuming diet #4 :							26	45	0.6	71
Number of species consuming diet #4 :							5	6	0.8	7

## Birds consuming main diet #5 (Carrion)

115 Vulture, King	B	14	B	11	5	0	1	3	0.3	4
116 Vulture, W' Backed	B	14	B	11	5	0	359	427	0.8	786
117 Vulture, Long Bill	B	14	B	11	5	0	15	22	0.7	37
118 Eagle, Tawny	B	12	B	11	5	4	1	0	All Wn	1
119 Vulture, Scavenger	C	18	C	12	5	13	153	34	4.5	187
Number of birds consuming diet #5 :							529	486	1.1	1015
Number of species consuming diet #5 :							5	4	1.3	5

Birds consuming a main diet of animal origin : 11677 9303 1.3 20980  
 Species consuming main diet of animal origin : 107 100 1.1 119

## Birds consuming main diet #6 (water vegetation)

120 Duck, Mallard	A	1	M	M	6	0	11	0	All Wn	11
121 Duck, Spotbill	A	2	A	2	6	0	718	446	1.6	1164
122 Duck, Pintail	A	2	M	M	6	0	3226	0	All Wn	3226
123 Duck, Wigeon	A	2	M	M	6	0	15	0	All Wn	15
124 Jacana, Bronze Wing	A	3	A	1	6	1	0	1	All Mo	1
125 Jacana, Phe's tail	A	3	A	1	6	1	0	31	All Mo	31

Table 6 (Contd.) THE DIETARY HABITS OF DELHI'S BIRDS.

	HAB NEST DIET						Win.	Mon.	Ratio	Total
	G	S	G	S	M	A	#'s	#'s	Wn/Mo	#'s
Time for Counts(Hours)	*	*	*	*	*	*	116.6	107.6	1.1	224.2
# Of Counts / Season	*	*	*	*	*	*	38	37	1	75
<hr/>										
0 127 Duck, Teal, Cotton	A	2	A	3	6	2	0	3	All Mo	3
128 Duck, Poch. R' Head	A	1	M	M	6	2	14	0	All Wn	14
129 Duck, Brahmini	A	8	M	M	6	2	270	7	38.6	277
Number of birds consuming diet #6 :							4340	488	9.0	4828
Number of species consuming diet #6 :							7	5	1.3	10
<hr/>										
Birds consuming main diet #7 (Grass seeds)										
130 Munia, W' Throated	B	14	B	9	7	0	122	103	1.2	225
131 Munia, W' Backed	B	14	B	9	7	0	0	6	All Mo	6
132 Lark, Others	B	12	B	7	7	1	71	69	1.0	140
133 Partridge, Black	B	13	B	8	7	1	8	89	0.1	97
134 Lark, R' Wing Bush	B	12	B	7	7	1	1	20	0.1	21
135 Quail, Bush	B	11	B	8	7	1	3	1	3.0	4
136 Partridge, Grey	B	13	B	8	7	1	55	93	0.6	148
137 Munia, Blackheaded	A	9	B	9	7	1	0	16	All Mo	16
138 Munia, Red	A	9	B	9	7	1	93	52	1.8	145
139 Lark, Crested	B	12	B	7	7	1	44	11	4.0	55
140 Munia, Spotted	B	14	B	9	7	1	23	2	11.5	25
141 Duck, Nakta	A	2	A	3	7	8	3	39	0.1	68
142 Dove, Spotted	B	14	B	10	7	12	1	3	0.3	4
143 Dove, Lit. Brown	B	12	B	10	7	12	311	432	0.7	743
144 Dove, Ringed	B	12	B	10	7	12	328	643	0.5	971
145 Dove, R' Turtle	B	14	B	10	7	12	4	11	0.4	15
Number of birds consuming diet #7 :							1067	1590	0.7	2683
Number of species consuming diet #7 :							14	16	1.4	16
<hr/>										
Birds consuming main diet #8 (Grasses and shoots)										
146 Goose, Greylag	A	10	M	M	8	0	58	0	All Wn	58
147 Goose, Barheaded	A	10	M	M	8	0	4	7	0.6	11
148 Crane, Demoisele	A	5	M	M	8	1	11	0	All Wn	11
149 Peafowl	B	13	B	8	8	4	91	178	0.5	269
Number of birds consuming diet #8 :							164	185	1.1	349
Number of species consuming diet #8 :							4	3	0.9	4
<hr/>										
Birds consuming main diet #9 (Berries and figs)										
150 Pigeon, Green	C	16	B	10	9	1	37	63	0.6	100
151 Barbet, Crim. Breas	C	15	B	10	9	1	14	111	0.1	125
152 Barbet, L' Green	C	16	B	10	9	1	5	26	0.2	31
153 Myna, Brahmini	B	14	C	12	9	1	182	168	1.1	350
154 Koel	C	16	B	11	9	1	16	52	0.3	68
155 Bulbul, W' Browed	B	12	B	10	9	1	1	0	All Wn	1
156 Bulbul, W' Cheek	B	12	B	10	9	1	68	128	0.5	196
157 Hornbill, Grey	C	16	B	11	9	4	6	18	0.3	24
Number of birds consuming diet #9 :							329	566	1.2	895
Number of species consuming diet #9 :							8	7	1.3	8
<hr/>										
Birds consuming main diet #10 (Flower nectar)										
158 Sunbird, P' Rumped	C	15	B	10	10	1	0	1	All Mo	1
159 Sunbird, Purple	C	15	B	10	10	1	132	219	0.6	351
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Birds consuming main diet #11 (Fruit)										
160 Tree Pie	B	13	B	11	11	4	21	50	0.4	71
161 Parakeet, Rose Ring	C	15	B	10	11	12	918	619	1.5	1537



Table 6 (Contd.) THE DIETARY HABITS OF DELHI'S BIRDS.

	HAB NEST DIET	Win.	Mon.	Ratio	Total
	G S G S M A	#'s	#'s	Wn/Mo	#'s
Time for Counts (Hours)	* * * * *	116.6	107.6	1.1	224.2
# Of Counts / Season	* * * * *	38	37	1	75
0 162 Parakeet, Bl'Head	B 13 B 10 11 12	15	6	2.5	21
163 Parakeet, Alexand.	C 15 B 11 11 12	20	6	3.3	26
Number of birds consuming diet #10 & 11 :		1106	901	7.7	2006
Number of species consuming diet #10 & 11		4	4	1.1	6
Birds consuming main diet #12 (Crops and seeds)					
164 Pigeon, BlueRock	C 18 C 12 12 0	1811	1872	1.0	3683
165 Weavers, Streaked	A 9 A 2 12 1	0	22	All Mo	22
166 Weavers, B' Breast	A 9 A 2 12 1	0	60	All Mo	60
167 Sparrow, House	C 18 C 12 12 1	781	812	1.0	1593
168 Weavers, Baya	B 14 A 3 12 1	111	72	1.5	183
169 Duck, Teal, Common	A 2 M M 12 6	1184	0	All Wn	1184
170 Rosy Pastor	B 14 M M 12 8	0	762	All Mo	762
Number of birds consuming diet #12 :		3887	3600	2.5	7487
Number of species consuming diet #12 :		4	6	1.1	7
Birds consuming a main diet of plant origin :					
Species consuming main diet of plant origin :		10893	7330	1.5	18248
		41	41	1.0	51
Birds consuming main diet #13 (Offal and garbage)					
171 Myna, Bank	C 18 A 5 13 1	344	589	0.6	933
172 Gull, (Uniden.)	C 18 M M 13 1	1400	0	All Wn	1400
173 Gulls, Brownheaded	C 18 M M 13 1	2	0	All Wn	2
174 Gulls, Blackheaded	C 18 M M 13 1	178	0	All Wn	178
175 Myna, Pied	A 10 B 10 13 1	559	616	0.9	1175
176 Myna, Common	C 18 C 12 13 1	1359	1580	0.9	2939
177 Crow, House	C 18 B 11 13 4	818	1337	0.6	2155
Number of birds consuming diet #13 :		4660	4122	2.4	8782
Number of species consuming diet #13 :		7	4	0.7	7
TOTAL NUMBER OF ALL BIRDS COUNTED :					
		27061	20755	1.3	47841
TOTAL NUMBER OF SPECIES IDENTIFIED :					
		155	145	1.1	177

Table 6. COMPARISON OF SPECIES 'TRENDS' IN THE VARIOUS AREAS OF DELHI

The following is a table of the Trends of various species in the different areas, and overall. For key to symbols, see Appendix 2.

Names of Areas	HAB NEST DIET							D'Park	ISBT	L'Gard.	R'Ghat	Zoo	O'All
	G	S	G	S	M	A							
1 Babbler, Common	B	12	B	9	1	9	?Acc	*	? Acc	0	*0	0	
2 Babbler, L'Grey	B	14	B	10	1	9	*0	*	*0	-1	0	*0	
3 Babbler, Jungle	C	15	B	9	1	9	*0	*0	*0	-2	0	*0	
4 Babbler, Striated	B	12	B	9	1	9				*		*	
5 Babbler, Yel'eyed	B	11	B	9	1	9	*		*		*	*	
6 Barbet, CrimBreast	C	15	B	10	9	1	*	*	-1	*	0	*0	
7 Barbet, L'Green	C	16	B	10	9	1	*	*	*	*	*	*	
8 BeeEater, Bluetail	B	12	A	5	1	0				*		*	
9 BeeEater, Green	B	14	A	5	1	0	0	0	-1	0	-1	*0	
10 BlueThroat	A	9	M	M	1	0			-1	0	*	*0	
11 Bulbul, Redvented	C	15	B	10	1	9	0	0	0	0	-2	0	
12 Bulbul, R'Whisker	B	13	B	10	1	9	*	*	1	*	-2	*0	
13 Bulbul, W'Browed	B	12	B	10	9	1	*					*	
14 Bulbul, W'Cheek	B	12	B	10	8	9	*		*		-2	-1	
15 Bushchat, Collared	B	9	M	M	1	0	*		*	*		*	
16 Bushchat, Pied	B	14	V	V	1	0	*	*	*	1	*	*	
17 Chat, BrownRock	C	17	C	12	1	0							
18 Crow, House	C	18	B	11	13	4	Inacc	*0	Inacc	Inacc	Inacc	Inacc	
19 Crow, Jungle	B	14	B	11	4	5	*	*	*	*	? Acc	*	
20 Crowpheasant	B	13	B	9	1	4	0	-1		0	0	0	
21 Cuckoo, IndianHawk	C	16	B	9	1	9	*			-1		*	
22 Cuckoo, PiedCrest	B	13	B	9	1	9	*	*				*	
23 Cuckoo, Plaintive	B	13	B	9	1	0							
24 Cuckoo, Sirkeer	B	12	B	9	4	9							
25 CuckooShrikeLarge	B	13	B	11	1	9	*					*	
26 Dove, Lit.'Brown	B	12	B	10	7	12	*0	0	0	0	0	0	
27 Dove, R'Turtle	B	14	B	10	7	12	*		*			*	
28 Dove, Ringed	B	12	B	10	7	12	0	0	0	*0	0	0	
29 Dove, Spotted	B	14	B	10	7	12							
30 Drongo, Black	B	14	B	11	1	10	*0	-1	-1	-1	-1	-2	
31 Flycatch, Greyhead	C	15	M	M	1	0	*					*	
32 Flycatch, Fantail	C	15	B	10	1	0	1		*	*		*	
33 Flycatch, R'Breast	C	15	M	M	1	0	*		-1	*	*	*	
34 Hoopoe	C	15	C	12	1	0	0	0	0	0	*0	0	
35 Hornbill, Grey	C	16	B	11	9	4	*	*	*		2	*	
36 Iora	C	16	B	11	1	0	*		*			*	
37 Koel	C	16	B	11	9	1	*	*0	0	*	*	*0	
38 Lark, R'WingBush	B	12	B	7	7	1				*		*	
39 Lark, Crested	B	12	B	7	7	1		-2			*	*0	
40 Lark, Others	B	12	B	7	7	1	*	0		-1	*	*0	
41 Martin, DuskyCrag	C	17	C	12	1	0		*	*		-1	*	
42 Martin, Sand	A	10	C	12	1	0		*		-2		*0	
43 Minivet, Scarlet	B	13	B	11	1	0	*			0		*	
44 Minivet, Small	B	13	B	11	1	0	*					*	
45 Munia, Blackheaded	A	9	B	9	7	1	*			-1		*	
46 Munia, Red	A	9	B	9	7	1		*		-1	*	*0	
47 Munia, Spotted	B	14	B	9	7	1			*	*	*	*	
48 Munia, W'Backed	B	14	B	9	7	0			*	*		*	



Table 6 (Contd.) COMPARISON OF SPECIES 'TRENDS' IN VARIOUS AREAS OF DELHI

Names of Areas	HAB NEST DIET													
	G	S	G	S	M	A		D'Park	ISBT	L'Gard.	R'Ghat	Zoo	D'All	
0 49 Munia, W'Throated	B	14	B	9	7	0		*	*	*0	*	1		*0
50 Myna, Bank	C	18	B	5	13	1		0	2		0	*		*0
51 Myna, Brahmini	B	14	C	12	9	1		*	-1	-2	*0	*0		*0
52 Myna, Common	C	18	C	12	13	1		2	1	0	0	0		1
53 Myna, Pied	A	10	B	10	13	1		0	0	0	0	0		0
54 Nightjar	B	12	B	10	1	0								
55 NuthatchC'nutBell	B	13	B	9	1	0								
56 Oriole, Golden	C	16	B	10	1	9		*	*	1		*0		*
57 Parakeet, Alexand.	C	15	B	11	11	12				*	*	-1		*
58 Parakeet, Bl'Head	B	13	B	10	11	12			*	*	*	*		*
59 Parakeet, RoseRing	C	15	B	10	11	12		0	*0	*0	0	0		0
60 Partridge, Black	B	13	B	8	7	1		*	*		*			*
61 Partridge, Grey	B	13	B	8	7	1		-2	*		*	*		*
62 Peafowl	B	13	B	8	8	4		0				1		*
63 Pigeon, BlueRock	C	18	C	12	12	0		1	? Inacc	*0	*0	*0	? Acc	Inacc
64 Pigeon, Green	C	16	B	10	9	1		*	*	0	*	*		*
65 Pipits(All)	B	14	B	7	1	0				*	-1	*		*
66 Quail, Bush	B	11	B	8	7	1					*	*		*
67 Robin, Indian	B	12	B	7	1	0		-2	*	-1	-2	0		-2
68 Robin, Magpie	C	15	B	10	1	10		1	*	-2	-1	-1		*0
69 Redstart	C	15	M	M	1	0		-1		0	0	-2		-2
70 Roller, Indian	B	14	B	10	1	4		*		*	-2			-1
71 RosyPastor	B	14	M	M	12	8			*0		*			*
72 Shrike, BayBacked	B	12	B	10	1	4		-2	0	0	0	-1		-1
73 Shrike, Grey	B	12	B	10	1	4		*			0			*
74 Shrike, RfsBacked	B	13	B	10	1	4		0	*		0	-2		*0
75 Shrike, CommonWood	B	13	B	10	1	0				*		*		*
76 Sparrow, House	C	18	B	12	12	1		Inacc	Inacc	Inacc	Inacc	Inacc		Inacc
77 Starling	A	10	M	M	1	4			-1		0	*		*0
78 StoneCurlew	C	14	A	4	1	4						-2		-2
79 Sunbird, Purple	C	15	B	10	10	1		*0	0	-2	*	-2		-1
80 Sunbird, P'Rumped	C	15	B	10	10	1				*				*0
81 Swallow, Cliff	A	10	C	12	1	0					*			*0
82 Swallow, Common	A	10	M	M	1	0		*	-1	*	*0	*		*0
83 Swallow, RedRump	A	10	C	12	1	0				*	*	*		*
84 Swallow, WireTail	A	10	C	12	1	0				*	*	-1		*
85 Swift, House	C	17	C	12	1	0		2	*	1	*	*		1
86 TailorBird	C	15	B	9	1	10		0	-1		*	-1		*0
87 Thrush, BlueRock	C	17	M	M	1	9					*	*		*
88 Thrush, B'Throat	C	17	M	M	1	9					*	*		*
89 TreePie	B	13	B	11	11	4		0		-1				*0
90 Wagtail, Grey	A	10	M	M	1	0		*	-2	*	*			*0

Table 6 (Contd.) COMPARISON OF SPECIES 'TRENDS' IN VARIOUS AREAS OF DELHI

Names of Areas	HAB NEST DIET							D'Park	ISBT	L'Gard.	R'Ghat	Zoo	D'Al
	G	S	G	S	M	A							
91 Wagtail, Pied	1A	10	C	12	1	0	0	0	0	0	0	0	0
92 Wagtail, White	1A	10	M	M	1	0	*	0	0	-1	-1	*	-1
93 Wagtail, Yellow	1A	10	M	M	1	0	*	-1	-1	0	*	*	*0
94 Wagtail, (Uniden.)	1A	10	M	M	1	0	*	*0		*0	*	*	*0
95 Warblers (All)	1A	10	V	V	1	0	-2	-2	0	-2	*	*	-2
96 WrenWarblers, Ashy	1B	13	B	9	1	0	0	0	*	0	-2	*	*0
97 WrenWarb, Indian	1B	12	B	B	1	0	*	*0	0	1	?	*	*0
98 WrenWarb, Others	1B	12	V	V	1	0	*	*	*	1	*	*	*
99 Weavers, Baya	1B	14	A	3	12	1			*	*	*	*	*
100 Weavers, B' Breast	1A	9	A	2	12	1				*	*	*	*
101 Weavers, Streaked	1A	9	A	2	12	1		*		*	*	*	*
102 WhiteEye	1C	16	B	10	1	9	*	0	-2		*	*	*0
103 Woodpecker, G' Back	1C	16	B	11	1	8	2		0		-2	*	*0
104 Woodpeck, Mahratta	1B	13	B	10	1	0			*	*	1	*	*
105 Wryneck	1B	13	B	10	1	0				*		*	*
BIRDS OF PREY													
106 Buzzard, WhiteEyed	1B	12	B	11	1	4							
107 Eagle, Tawny	1B	12	B	11	5	4							
108 Harrier, Marsh	1A	10	M	M	?	?				-2			-2
109 Harrier, Pale	1B	14	M	M	4	0			*				*
110 Kestrel	1B	12	M	M	4	0							
111 Kites, BlackWing	1B	12	B	11	1	4							
112 Kites, Pariah	1C	18	B	11	1	4	0	? Acc	? Acc	? Acc	? Acc	? Acc	? Acc
113 Owl, Barn	1B	17	B	12	4	0							
114 Owl, Great horned	1B	12	B		4	3							
115 Owlet, Spotted	1B	13	B	11	1	4	*		*				*
116 Shikra	1B	12	B	11	4	0				*			*
117 Vulture, King	1B	14	B	11	5	0							
118 Vulture, LongBill	1B	14	B	11	5	0			*	*	*	*	*
119 Vulture, Scavenger	1C	18	B	12	5	13		*	*	-1	? Acc	*	*
120 Vulture, W' Backed	1B	14	B	11	5	0	? Acc	? Acc	? Acc	? Acc	? Acc	? Acc	? Acc
WATER BIRDS													
121 Avocet	1A	5	M	M	2	0		*		*			*
122 Bittern, Little	1A	6	A	3	3	0				*			*
123 Coot	1A	2	A	2	2	6		*		*			*
124 Cormorant (All)	1A	7	A	3	3	0		0	*	0	*0	*	*0
125 Crane, Demoisele	1A	5	M	M	8	1					*	*	*
126 Dabchick	1A	2	A	1	2	3	*	*		*0	*	*	*
127 Duck, Brahmini	1A	8	M	M	6	2		-2			?	*	-1
128 Duck, Mallard	1A	1	M	M	6	0					*	*	*
129 Duck, Nakta	1A	2	A	3	7	8		*			1	*	*0
130 Duck, Pintail	1A	2	M	M	6	0		*0		-2	0	*	*0
131 Duck, Pochard, Com.	1A	1	M	M	6	2				*		*	*
132 Duck, Poch. R' Head	1A	1	M	M	6	2		*		*		*	*
133 Duck, Poch. Tufted	1A	1	M	M	2	6				-1		*	-1
134 Duck, Shoveller	1A	1	M	M	3	2		-2		-1	*0	*	-1
135 Duck, Spotbill	1A	2	A	2	6	0		-1	*	1	1	*	1
136 Duck, Teal, Common	1A	2	M	M	12	6		*0		-1	*	*	*0



Table 6 (Contd.) COMPARISON OF SPECIES 'TRENDS' IN VARIOUS AREAS OF DELHI

Names of Areas	HAB NEST DIET						D'Park	ISBT	L'Gard.	R'Ghat	Zoo	O'All
	G	S	G	S	M	A						
0137 Duck, Teal, Cotton	1A	2	A	3	6	2	1	*			*	1
138 Duck, Wigeon	1A	2	M	M	6	0	1	*		*		*
139 Egret, Cattle	1B	14	A	3	1	3	1	*0	*	1	0	1
140 Egret, Large	1A	4	A	3	3	1	1	*	*	-2	1	*0
141 Egret, Little	1A	4	A	3	1	3	1	*		0	0	*0
142 Goose, Barheaded	1A	10	M	M	8	0	1	*			*	*
143 Goose, Greylag	1A	10	M	M	8	0	1			*	*	*
144 Gulls, Blackheaded	1A	18	M	M	13	1	1			*0		*0
145 Gulls, Brownheaded	1A	18	M	M	13	1	1			*		*
146 Gull, Unidentified	1A	18	M	M	13	1	1	0				0
147 Herons, Grey	1A	5	A	3	3	0	1	-2		*	*	-1
148 Heron, Night	1A	7	A	3	3	2	1				*0	*0
149 Heron, Pond	1A	4	A	3	3	2	1	*	-1	*	0	0
150 Heron, Purple	1A	5	A	3	3	0	1	*		0		0
151 Ibis, White	1A	5	A	3	3	2	1				*	*
152 Jacana, BronzeWing	1A	9	A	1	6	1	1			*		*
153 Jacana, Phe's tail	1A	9	A	1	6	1	1	*		-2		-2
154 Kingfish, Lit' blue	1A	7	A	5	3	2	1		*	*	*	*
155 Kingfisher, Pied	1A	7	A	5	3	2	1	*		0	*	0
156 Kingfisher, S' bill	1A	7	A	5	3	4	1					*
157 Kingfisher White Br	1A	7	A	5	3	1	1	*	-1	*	-1	-1
158 Lapwing, R' Wattled	1A	10	A	6	1	2	1	*0	0		2	0
159 Lapwing, Y' Wattled	1B	14	A	6	1	2	1			*	*	*
160 Lapwing, W' Tailed	1A	10	A	4	2	0	1		0	*		*
161 Moorhen, Indian	1A	6	A	2	2	6	1				*0	*0
162 Pelican, Rosy	1A	5	M	11	3	0	1				*	*
163 Plovers, Kentish	1A	5	A	4	1	2	1	*		*		*
164 Plovers, L' Ringed	1A	5	A	4	1	2	1	*		*		*
165 Plover, Spurwinged	1A	8	A	4	1	0	1	*				*
166 Pranticole, Sm. Ind	1A	8	A	4	2	6	1			*		*
167 Sandpiper, Common	1A	5	M	M	2	0	1	0	0	0	*	0
168 Sandpiper, Green	1A	5	M	M	2	0	1	*		*	*	*
169 Sandpiper, R' shank	1A	5	M	M	2	0	1	*		1		*
170 Sandpiper, Spotted	1A	5	M	M	2	0	1	*		0		*
171 Sandpiper, Others	1A	5	M	M	2	0	1	*		*		*
172 Stilt, B' Winged	1A	5	M	4	2	0	1	*0				1
173 Stint, Little	1A	5	M	M	2	0	1	*0		*		*
174 Stork, Blackneck	1A	5	A	3	3	0	1					
175 Stork, Painted	1A	5	A	3	3	0	1	-2		-1	-2	-2
176 Terns (All)	1A	1	M	1	3	2	1				*	*
177 Waterhen, W' Breast	1A	6	A	2	2	6	1	*	-1	0	0	*0

Table 7. OVERALL TRENDS OF DELHI'S BIRDS.

The following table lists the birds seen in the counts according to their 'trends' (see Glossary for definition). For key to the symbols used, see Appendix 2.

		HAB NEST DIET													
Names of Areas		G	S	G	S	M	A	D'Park	ISBT	L'Gard.	R'Ghat	Zoo	O'All		
Names of Birds		-	-	-	-	-	-						Trend		
1 Sunbird, P'Rumped	C	15	B	10	10	1				*			?Sigh		
2 Kites, Pariah	C	18	B	11	1	4		0	? Acc	? Acc	? Acc	? Acc	? Acc		
3 Vulture, W'Backed	B	14	B	11	5	0		? Acc	? Acc	? Acc	? Acc	? Acc	? Acc		
4 Crow, House	C	18	B	11	13	4		Inacc	*0	Inacc	Inacc	Inacc	Inacc		
5 Pigeon, BlueRock	C	18	C	12	12	0		1	? Inac	*0	*0	? Acc	Inacc		
6 Sparrow, House	C	18	B	12	12	1		Inacc	Inacc	Inacc	Inacc	Inacc	Inacc		
7 Drongo, Black	B	14	B	11	1	10		*0	-1	-1	-1	-1	-2		
8 Harrier, Marsh	A	10	M	M	?	?					-2		-2		
9 Jacana, Phes'tail	A	9	A	1	6	1			*		-2		-2		
10 Redstart	C	15	M	M	1	0		-1		0	0	-2	-2		
11 Robin, Indian	B	12	B	7	1	0		-2	*	-1	-2	0	-2		
12 StoneCurlew	C	14	A	4	1	4						-2	-2		
13 Stork, Painted	A	5	A	3	3	0			-2		-1	-2	-2		
14 Warblers(All)	A	10	V	V	1	0		-2	-2	0	-2	*	-2		
15 Bulbul, W'Cheek	B	12	B	10	8	9		*		*		-2	-1		
16 Duck, Brahmini	A	8	M	M	6	2			-2			?	-1		
17 Duck, Poch. Tufted	A	1	M	M	2	6					-1		-1		
18 Duck, Shoveller	A	1	M	M	3	2			-2		-1	*0	-1		
19 Herons, Grey	A	5	A	3	3	0			-2		*	*	-1		
20 Kingfisher WhiteBr	A	7	A	5	3	1		*	-1	*	-1	0	-1		
21 Roller, Indian	B	14	B	10	1	4		*		*	-2		-1		
22 Shrike, BayBacked	B	12	B	10	1	4		-2	0	0	0	-1	-1		
23 Sunbird, Purple	C	15	B	10	10	1		*0	0	-2	*	-2	-1		
24 Wagtail, White	A	10	M	M	1	0		*	0	0	-1	-1	-1		
25 Babbler, Jungle	C	15	B	9	1	9		*0	*0	*0	-2	0	*0		
26 Babbler, L'Grey	B	14	B	10	1	9		*0	*	*0	-1	0	*0		
27 Barbet, CrimBreast	C	15	B	10	9	1		*	*	-1	*	0	*0		
28 BeeEater, Green	B	14	A	5	1	0		0	0	-1	0	-1	*0		
29 BlueThroat	A	9	M	M	1	0				-1	0	*	*0		
30 Bulbul, R'Whisker	B	13	B	10	1	9		*	*	1	*	-2	*0		
31 Cormorant (All)	A	7	A	3	3	0			0	*	0	*0	*0		
32 Duck, Nakta	A	2	A	3	7	8			*			1	*0		
33 Duck, Pintail	A	2	M	M	6	0			*0		-2	0	*0		
34 Duck, Teal, Common	A	2	M	M	12	6			*0		-1	*	*0		
35 Egret, Large	A	4	A	3	3	1			*	*	-2	1	*0		
36 Egret, Little	A	4	A	3	1	3		*	-1		0	0	*0		
37 Gulls, Blackheaded	A	18	M	M	13	1					*0		*0		
38 Heron, Night	A	7	A	3	3	2						*0	*0		
39 Koel	C	16	B	11	9	1		*	*0	0	*	*	*0		
40 Lark, Crested	B	12	B	7	7	1			-2			*	*0		
41 Lark, Others	B	12	B	7	7	1		*	0		-1	*	*0		
42 Martin, Sand	A	10	C	12	1	0			*		-2		*0		
43 Moorhen, Indian	A	6	A	2	2	6						*0	*0		
44 Munia, Red	A	9	B	9	7	1			*		-1	*	*0		
45 Munia, W'Throated	B	14	B	9	7	0		*	*	*0	*	1	*0		



Table 7 (Contd.) OVERALL TRENDS OF DELHI'S BIRDS.

Names of Areas Names of Birds	HAB NEST DIET							D'Park	ISBT	L'Gard.	R'Ghat	Zoo	D'All Trends
	G	S	G	S	M	A							
46 Myna, Bank	10	18	B	5	13	1	1	0	2		0	*	1
47 Myna, Brahmini	1B	14	C	12	9	1	1	*	-1	-2	*0	*0	*0
48 Robin, Magpie	1C	15	B	10	1	10	1	1	*	-2	-1	-1	*0
49 Shrike, RfsBacked	1B	13	B	10	1	4	1	0	*		0	-2	*0
50 Starling	1A	10	M	M	1	4	1		-1		0	*	*0
51 Swallow, Common	1A	10	M	M	1	0	1	*	-1	*	*0	*	*0
52 TailorBird	1C	15	B	9	1	10	1	0	-1		*	-1	*0
53 TreePie	1B	13	B	11	11	4	1	0		-1			*0
54 Wagtail, Grey	1A	10	M	M	1	0	1	*	-2	*	*		*0
55 Wagtail, Yellow	1A	10	M	M	1	0	1		-1	-1	0	*	*0
56 Wagtail, (Uniden.)	1A	10	M	M	1	0	1		*0		*0	*	*0
57 Waterhen, W' Breast	1A	6	A	2	2	6	1		*	-1	0	0	*0
58 WhiteEye	1C	16	B	10	1	9	1	*	0	-2		*	*0
59 Woodpecker, G' Back	1C	16	B	11	1	8	1	2		0		-2	*0
60 WrenWarblers, Ashy	1B	13	B	9	1	0	1	0	0	*	0	-2	*0
61 WrenWarb, Indian	1B	12	B	8	1	0	1	*	*0	0	1	?	*0
62 Avocet	1A	5	M	M	2	0	1		*		*		*
63 Babbler, Striated	1B	12	B	9	1	9	1				*		*
64 Babbler, Yel'eyed	1B	11	B	9	1	9	1	*		*		*	*
65 Barbet, L'Green	1C	16	B	10	9	1	1	*	*	*	*	*	*
66 BeeEater, Bluetail	1B	12	A	5	1	0	1				*		*
67 Bittern, Little	1A	6	A	3	3	0	1				*		*
68 Bulbul, W' Browed	1B	12	B	10	9	1	1	*					*
69 Bushchat, Collared	1B	9	M	M	1	0	1	*		*	*		*
70 Bushchat, Pied	1B	14	V	V	1	0	1	*	*	*	1	*	*
71 Coot	1A	2	A	2	2	6	1		*		*		*
72 Crane, Demoisele	1A	5	M	M	8	1	1					*	*
73 Crow, Jungle	1B	14	B	11	4	5	1	*	*	*	*	? Acc	*
74 CuckooShrikeLarge	1B	13	B	11	1	9	1	*					*
75 Cuckoo, IndianHawk	1C	16	B	9	1	9	1	*			-1		*
76 Cuckoo, PiedCrest	1B	13	B	9	1	9	1	*	*				*
77 Dabchick	1A	2	A	1	2	3	1	*	*		*0	*	*
78 Dove, R' Turtle	1B	14	B	10	7	12	1	*		*			*
79 Duck, Mallard	1A	1	M	M	6	0	1					*	*
80 Duck, Pochard, Com.	1A	1	M	M	6	2	1				*		*
81 Duck, Poch. R' Head	1A	1	M	M	6	2	1		*		*		*
82 Duck, Teal, Cotton	1A	2	A	3	6	2	1		*			*	*
83 Duck, Wigeon	1A	2	M	M	6	0	1				*		*
84 Flycatch, Fantail	1C	15	B	10	1	0	1	1		*	*		*
85 Flycatch, Greyhead	1C	15	M	M	1	0	1	*					*
86 Flycatch, R' Breast	1C	15	M	M	1	0	1	*		-1	*	*	*
87 Goose, Barheaded	1A	10	M	M	8	0	1		*			*	*
88 Goose, Greylag	1A	10	M	M	8	0	1				*	*	*
89 Gulls, Brownheaded	1A	18	M	M	13	1	1				*		*
90 Harrier, Pale	1B	14	M	M	4	0	1			*			*
91 Hornbill, Grey	1C	16	B	11	9	4	1	*	*	*		2	*
92 Ibis, White	1A	5	A	3	3	2	1				*		*
93 Iora	1C	16	B	11	1	0	1	*		*			*
94 Jacana, Bronzewing	1A	9	A	1	6	1	1				*		*
95 Kingfisher, S'bill	1A	7	A	5	3	4	1						*

Table 7 (Contd.) OVERALL TRENDS OF DELHI'S BIRDS.

Names of Areas Names of Birds	HAB NEST DIET						D'Park	ISBT	L'Gard.	R'Ghat	Zoo	O'All Trends
	G	S	G	S	M	A						
96 Kingfish, Lit'blue	A	7	A	5	3	2			*	*	*	*
97 Lapwing, W'Tailed	A	10	A	4	2	0			0	*		*
98 Lapwing, Y'Wattled	B	14	A	6	1	2			*	*		*
99 Lark, R'WingBush	B	12	B	7	7	1			*	*		*
100 Martin, DuskyCrag	C	17	C	12	1	0		*	*		-1	*
101 Minivet, Scarlet	B	13	B	11	1	0	*			0		*
102 Minivet, Small	B	13	B	11	1	0	*					*
103 Munia, Spotted	B	14	B	9	7	1			*	*	*	*
104 Munia, W'Backed	B	14	B	9	7	0			*	*		*
105 Munia, Blackheaded	A	9	B	9	7	1	*			-1		*
106 Oriole, Golden	C	16	B	10	1	9	*	*	1		*0	*
107 Owlet, Spotted	B	13	B	11	1	4	*		*	*		*
108 Parakeet, Alexand.	C	15	B	11	11	12			*	*	-1	*
109 Parakeet, Bl'Head	B	13	B	10	11	12		*	*	*	*	*
110 Partridge, Black	B	13	B	8	7	1	*	*	*	*		*
111 Partridge, Grey	B	13	B	8	7	1	-2	*	*	*	*	*
112 Peafowl	B	13	B	8	8	4	0				1	*
113 Pelican, Rosy	A	5	M	11	3	0					*	*
114 Pigeon, Green	C	16	B	10	9	1	*	*	0	*	*	*
115 Pipits(All)	B	14	B	7	1	0			*	-1	*	*
116 Plovers, Kentish	A	5	A	4	1	2		*	*	*		*
117 Plovers, L'Ringed	A	5	A	4	1	2		*	*	*		*
118 Plover, Spurwinged	A	8	A	4	1	0		*				*
119 Pranticole, Sm. Ind	A	8	A	4	2	6				*		*
120 Quail, Bush	B	11	B	8	7	1				*		*
121 RosyPastor	B	14	M	M	12	8		*0	*	*		*
122 Sandpiper, Green	A	5	M	M	2	0		*	*	*	*	*
123 Sandpiper, Others	A	5	M	M	2	0		*	*	*		*
124 Sandpiper, R'shank	A	5	M	M	2	0		*		1		*
125 Sandpiper, Spotted	A	5	M	M	2	0		*		0		*
126 Shikra	B	12	B	11	4	0				*		*
127 Shrike, CommonWood	B	13	B	10	1	0			*		*	*
128 Shrike, Grey	B	12	B	10	1	4	*			0		*
129 Stint, Little	A	5	M	M	2	0		*0	*	*		*
130 Swallow, Cliff	A	10	C	12	1	0			*	*		*
131 Swallow, RedRump	A	10	C	12	1	0			*	*	*	*
132 Swallow, WireTail	A	10	C	12	1	0			*	*	-1	*
133 Terns (All)	A	1	M	1	3	2					*	*
134 Thrush, BlueRock	C	17	M	M	1	9					*	*
135 Thrush, B'Throat	C	17	M	M	1	9				*		*
136 Vulture, LongBill	B	14	B	11	5	0			*	*	*	*
137 Vulture, Scavenger	C	18	B	12	5	13		*	*	-1	? Acc	*
138 Weavers, Baya	B	14	A	3	12	1			*	*	*	*
139 Weavers, B'Breast	A	9	A	2	12	1					*	*
140 Weavers, Streaked	A	9	A	2	12	1		*		*	*	*
141 Woodpeck, Mahratta	B	13	B	10	1	0			*	*	1	*
142 WrenWarb, Others	B	12	V	V	1	0		*	*	1	*	*
143 Wryneck	B	13	B	10	1	0				*		*
144 Duck, Spotbill	A	2	A	2	6	0		-1	*	1	1	1
145 Egret, Cattle	B	14	A	3	1	3	1	*0	*	1	0	1
146 Lapwing, R'Wattled	A	10	A	6	1	2	*0	0		2	0	1



Table 7 (Contd.) OVERALL TRENDS OF DELHI'S BIRDS.

Names of Areas Names of Birds	HAB NEST DIET						D'Park	ISBT	L'Gard.	R'Ghat	Zoo	O'All Trends
	G	S	G	S	M	A						
0147 Myna, Common	10	18	C	12	13	1	2	1	0	0	0	1
148 Stilt, B'Winged	1A	5	M	4	2	0	1	*0				1
149 Swift, House	1C	17	C	12	1	0	2	*	1	*	*	1
150 Babbler, Common	1B	12	B	9	1	9	?Acc	*	? Acc	0	*0	0
151 Bulbul, Redvented	1C	15	B	10	1	9	0	0	0	0	-2	0
152 Crowpheasant	1B	13	B	9	1	4	0	-1		0	0	0
153 Dove, Lit.' Brown	1B	12	B	10	7	12	*0	0	0	0	0	0
154 Dove, Ringed	1B	12	B	10	7	12	0	0	0	*0	0	0
155 Gull, Unidentified	1A	18	M	M	13	1		0				0
156 Heron, Pond	1A	4	A	3	3	2	*	-1	*	0	0	0
157 Heron, Purple	1A	5	A	3	3	0		*		0		0
158 Hoopoe	1C	15	C	12	1	0	0	0	0	0	*0	0
159 Kingfisher, Pied	1A	7	A	5	3	2		*		0	*	0
160 Myna, Pied	1A	10	B	10	13	1	0	0	0	0	0	0
161 Parakeet, Rose Ring	1C	15	B	10	11	12	0	*0	*0	0	0	0
162 Sandpiper, Common	1A	5	M	M	2	0	1	0	0	0	*	0
163 Wagtail, Pied	1A	10	C	12	1	0	0	0	0	0	0	0

Table 8 (a). THE THREATENED BIRDS OF DELHI.

Names of Areas Names of Birds	HAB NEST DIET						D'Park	ISBT	L'Gard.	R'Ghat	Zoo	O'All Trends
	G	S	G	S	M	A						
1 Drongo, Black	1B	14	B	11	1	10	*0	-1	-1	-1	-1	-2
2 Harrier, Marsh	1A	10	M	M	?	?				-2		-2
3 Jacana, Phes'tail	1A	9	A	1	6	1		*		-2		-2
4 Redstart	1C	15	M	M	1	0	-1		0	0	-2	-2
5 Robin, Indian	1B	12	B	7	1	0	-2	*	-1	-2	0	-2
6 StoneCurlew	1C	14	A	4	1	4					-2	-2
7 Stork, Painted	1A	5	A	3	3	0		-2		-1	-2	-2
8 Warblers (All)	1A	10	V	V	1	0	-2	-2	0	-2	*	-2
9 Bulbul, W'Cheek	1B	12	B	10	8	9	*		*		-2	-1
10 Duck, Brahmini	1A	8	M	M	6	2		-2			?	-1
11 Duck, Poch. Tufted	1A	1	M	M	2	6				-1		-1
12 Duck, Shoveller	1A	1	M	M	3	2		-2		-1	*0	-1
13 Herons, Grey	1A	5	A	3	3	0		-2		*	*	-1
14 Kingfisher White Br	1A	7	A	5	3	1	*	-1	*	-1	0	-1
15 Roller, Indian	1B	14	B	10	1	4	*		*	-2		-1
16 Shrike, Bay Backed	1B	12	B	10	1	4	-2	0	0	0	-1	-1
17 Sunbird, Purple	1C	15	B	10	10	1	*0	0	-2	*	-2	-1
18 Wagtail, White	1A	10	M	M	1	0	*	0	0	-1	-1	-1

Table B (b). THE HABITATS OF THE THREATENED BIRDS OF DELHI.

Names of Areas Names of Birds	HAB NEST DIET						D'Park	ISBT	L'Gard.	R'Ghat	Zoo	O'All Trend
	G	S	G	S	M	A						
1 Duck, Shoveller	A	1	M	M	3	2		-2		-1	*0	-1
2 Duck, Poch. Tufted	A	1	M	M	2	6				-1		-1
3 Herons, Grey	A	5	A	3	3	0		-2		*	*	-1
4 Stork, Painted	A	5	A	3	3	0		-2		-1	-2	-2
5 Kingfisher White Br	A	7	A	5	3	1	*	-1	*	-1	0	-1
6 Duck, Brahmini	A	8	M	M	6	2		-2			?	-1
7 Jacana, Phe's tail	A	9	A	1	6	1		*		-2		-2
8 Wagtail, White	A	10	M	M	1	0	*	0	0	-1	-1	-1
9 Warblers (All)	A	10	V	V	1	0	-2	-2	0	-2	*	-2
10 Harrier, Marsh	A	10	M	M	4	2				-2		-2
11 Shrike, Bay Backed	B	12	B	10	1	4	-2	0	0	0	-1	-1
12 Bulbul, W' Cheek	B	12	B	10	8	9	*		*		-2	-1
13 Robin, Indian	B	12	B	7	1	0	-2	*	-1	-2	0	-2
14 Roller, Indian	B	14	B	10	1	4	*		*	-2		-1
15 Stone Curlew	C	14	A	4	1	4					-2	-2
16 Drongo, Black	B	14	B	11	1	10	*0	-1	-1	-1	-1	-2
17 Sunbird, Purple	C	15	B	10	10	1	*0	0	-2	*	-2	-1
18 Redstart	C	15	M	M	1	0	-1		0	0	-2	-2

Table B (c) THE NESTING OF THE THREATENED BIRDS OF DELHI.

Names of Areas Names of Birds	HAB NEST DIET						D'Park	ISBT	L'Gard.	R'Ghat	Zoo	O'All Trend
	G	S	G	S	M	A						
1 Duck, Poch. Tufted	A	1	M	M	2	6				-1		-1
2 Duck, Shoveller	A	1	M	M	3	2		-2		-1	*0	-1
3 Duck, Brahmini	A	8	M	M	6	2		-2			?	-1
4 Harrier, Marsh	A	10	M	M	4	2				-2		-2
5 Wagtail, White	A	10	M	M	1	0	*	0	0	-1	-1	-1
6 Redstart	C	15	M	M	1	0	-1		0	0	-2	-2
7 Warblers (All)	A	10	V	V	1	0	-2	-2	0	-2	*	-2
8 Jacana, Phe's tail	A	9	A	1	6	1		*		-2		-2
9 Stork, Painted	A	5	A	3	3	0		-2		-1	-2	-2
10 Herons, Grey	A	5	A	3	3	0		-2		*	*	-1
11 Stone Curlew	C	14	A	4	1	4					-2	-2
12 Kingfisher White Br	A	7	A	5	3	1	*	-1	*	-1	0	-1
13 Robin, Indian	B	12	B	7	1	0	-2	*	-1	-2	0	-2
14 Shrike, Bay Backed	B	12	B	10	1	4	-2	0	0	0	-1	-1
15 Bulbul, W' Cheek	B	12	B	10	8	9	*		*		-2	-1
16 Roller, Indian	B	14	B	10	1	4	*		*	-2		-1
17 Sunbird, Purple	C	15	B	10	10	1	*0	0	-2	*	-2	-1
18 Drongo, Black	B	14	B	11	1	10	*0	-1	-1	-1	-1	-2



Table B (d). THE DIETARY REQUIREMENTS OF THE THREATENED BIRDS OF DELHI

Names of Areas Names of Birds	HAB NEST DIET						D'Park	ISBT	L'Gard.	R'Ghat	Zoo	D'A Tre
	G	S	G	S	M	A						
1 Robin, Indian	B	12	B	7	1	0	-2	*	-1	-2	0	-
2 Wagtail, White	A	10	M	M	1	0	*	0	0	-1	-1	-
3 Warblers (All)	A	10	V	V	1	0	-2	-2	0	-2	*	-
4 Redstart	C	15	M	M	1	0	-1		0	0	-2	-
5 Stone Curlew	C	14	A	4	1	4					-2	-
6 Shrike, Bay Backed	B	12	B	10	1	4	-2	0	0	0	-1	-
7 Roller, Indian	B	14	B	10	1	4	*		*	-2		-
8 Drongo, Black	B	14	B	11	1	10	*0	-1	-1	-1	-1	-
9 Duck, Poch. Tufted	A	1	M	M	2	6				-1		-
10 Stork, Painted	A	5	A	3	3	0		-2		-1	-2	-
11 Herons, Grey	A	5	A	3	3	0		-2		*	*	-
12 Kingfisher White Br	A	7	A	5	3	1	*	-1	*	-1	0	-
13 Duck, Shoveller	A	1	M	M	3	2		-2		-1	*0	-
14 Harrier, Marsh	A	10	M	M	4	2				-2		-
15 Jacana, Phe's tail	A	9	A	1	6	1		*		-2		-
16 Duck, Brahmini	A	8	M	M	6	2		-2			?	-
17 Bulbul, W' Cheek	B	12	B	10	8	9	*		*		-2	-
18 Sunbird, Purple	C	15	B	10	10	1	*0	0	-2	*	-2	-

SECTION C

Analysis of Individual Areas.



## ANALYSIS OF THE NATIONAL (DELHI) ZOO BIRD COUNT.

### INTRODUCTION.

Since bi-annual bird counts were begun in the National Zoo in Jan.1981, 11 counts have been undertaken. Of these, 5 have been in winter and 6 in the monsoons. The counts of monsoon 1982 and winter 1984 were abandoned due to bad weather conditions, while the count results of winter 1985 have, unfortunately, been misplaced. None-the-less, the 11 counts for which the results are available to us lend themselves to systematic analysis with some interesting results.

The National Zoo encompasses a relatively small area of 196 acres. Yet, due to the existence of both a stable water habitat, and extensive lawns in which plantation of a large variety of trees, bushes and shrubs has been done, it is able to harbour a large variety of wild birds; the the monuments in and along the Zoo's boundries also provide an additional habitat area for yet other species. Today it is the known focal breeding-point, in Delhi, of several of the larger water-birds. Inclusion of this area in the bird-counts, was then, clearly important, and such was the case since the inception of the bird-counts in 1981.

### THE BIRDS OF THE ZOO.

In the 11 counts held here till now, 105 species of birds have been identified (section B of the Summary). Of these 105 species, 70 species are land birds, 31 water birds, and only 4 are birds of prey. This compares with 105, 57, and 15 respectively in all the other areas taken together. The numbers of species sighted varied from 38 to 55 (average 49) species in the 5 winter counts, and they varied from 40 to 50 (average 44) species in the 6 monsoon counts.

Overall, the land birds are well represented in the Zoo (70 of 105 or 67%, of the species seen all over Delhi). Of the water-birds, the waders are almost absent; only 2 of the 21 species seen in Delhi, being represented here, hence the 31 of 57 (56%) species of water-birds sighted here. The birds of prey are the most poorly represented here, as only 4 of the 15 species (29%) seen in Delhi were sighted here; these too the commonest of them. This is, of course, no surprise, since, along with other considerations, most of these birds shun interaction with humans.

### THE NUMBERS OF THE ZOO'S BIRDS.

The total number of individual bird per count averaged 1,625 in winter, and 791 in the monsoons. This means that the Zoo harbours double the number of birds in winter, as it does in the monsoons, but the numbers of species is not so markedly different, as seen in the earlier section. The greatly increased numbers of birds in the winter, is primarily due to the migratory ducks that come in large numbers during these months to the Zoo. This is clearly seen when the numbers of the land and water-birds are looked at seperately: 2258 land birds in the monsoon to 2729 in winter, versus 2222 water-birds in the

monsoons to 5164 in winter (see section C of Summary).

Clearly, the most numerous species overall are the Ducks; of the five most numerous species, the 1st., 3rd. and 4th. are Ducks (see section D of Summary). The Cormorants, the Night Herons and Red Wattled Lapwing, also fall in the 10 most numerous water-birds. Of the land birds, only the Blue Rock Pigeon is among the 5 most numerous birds; the Common Myna, House Crow and Pariah Kite are among the first 10 (not given in Summary).

It is also apparent that the winter migrants that visit the zoo in the largest numbers are in fact, only 3; these are the Pintail and Shoveller Ducks, and the Common Teal (of which there were only two sightings). All the remaining 18 known winter migrants have been counted in numbers of less than 45 birds over all the past counts, and 12 of these species were seen only once or twice in the 5 winter counts in numbers less than 11 in total. Infact, the Blue Throat, Common and Green Sandpipers, and the Blue Rock Thrush, were seen only once each; all figures demonstrating that the majority of known winter migrants to the Zoo (and indeed to the whole of Delhi, as shown in an earlier chapter), are seen in small numbers.

#### SEASONAL STATUS OF THE ZOO'S BIRDS.

Based on the data we have collected, some interesting comments can be made about the seasonal prevalence of the birds (see section E of Summary). It is seen that 29 species show a monsoon predominance; ie. their numbers in the monsoon are at least double of what they are in the winters. Included among these are the Night, Pond and Grey Herons, Cattle, Little, and Large Egrets, Cormorants etc. (among the water birds), and the Golden Oriole, White Throated Munia, Streaked Weavers, Koel and Mahratta Woodpecker, among the monsoon birds.

Of all these species the ones that can be stated to be monsoon migrants to the Zoo, are the Night Herons and Cattle Egrets among the water birds, and Golden Orioles, White Throated Munia, Koel, and Mahratta Woodpeckers among the land birds (all with win/mon ratio of  $<0.2$ ). This list does not include species, for which this designation cannot be given based on the count data alone.

Now moving onto the birds with a winter preponderance: 40 species, are atleast twice as numerous in the winter as in the monsoons (see section E of Summary). 23 species are known winter migrants from abroad. By far the most numerous of these are the Pintail and Shoveller Ducks. Some of the remaining birds that showed a winter predominance appear to be locally migrant to the Zoo in winter. Among the locally migrant birds to the Zoo in winter are the Painted Stork, Large Pied Wagtail, Indian Wren Warbler, and possibly the Bank Myna. Some of these winter predominant birds eg. some Munias and White Eyes, were seen only once, and therefore no definite conclusion can be drawn regarding them. (see section E of Summary).

What of those birds that are more-or-less equally prevalent during both seasons in the Zoo? These birds number 36 species and include the Large Grey Babbler, Hoopoe, Purple Sunbird, Spotbill Duck, White Breasted Waterhen, and many



others. This group also includes those birds that are usually seen flying overhead, eg. various Vultures and the Pariah Kite, but as these species are difficult to count accurately, no definite comment can be made about them.

#### THE STATUS OF THE ZOO'S BIRDS.

It was found that the numbers of 44 species overall were too few to analyse, 8 species showed varying numbers, 9 species were not analysed due to our doubts about the accuracy of the numbers recorded, or about the consistency of their identification. This left a sub-group of 42 of the original 105 species seen about which comments could be made (see section F of the Summary). Of these, 18 species did not show any significant change in their numbers over the count period.

A total 7 species showed a probable or definite increase in their numbers. These are the Peafowl, Mahratta Woodpecker, White Throated Munia, Nakta and Spotbill Ducks, Large Egret and the Grey Hornbill. Only the last named seems to have definitely become commoner. It is interesting to note, therefore, that the Zoo has managed to provide conditions suitable for both the resident Nakta and Spotbill ducks; this indeed is heartening, as chances of these birds thriving in any other part of metropolitan Delhi are remote.

18 species among the land, and only 1 among the water-birds showed a definite or probable decrease. This, clearly, being the group that requires most attention, will now be examined further (see section F of Summary). It is seen that 10 birds, have, since the counts began in 1981, shown a definite decline. Among these are the Stone Curlew, Rufous Backed Shrike, Purple Sunbird, Golden Backed Woodpecker and, interestingly all three Bulbuls (White Cheeked, Red Whiskered and even the Redvented). Though the Painted Stork appears to be definitely decreasing too, the fact that none were recorded as being seen in winter 1987, is certainly an error on the part of the recording team, as this is inconsistent with records of other bird-watchers during the same period. Hence, the true status of the Painted Stork must await confirmation. Of the known winter migrants, only the Redstart can be definitely stated to be decreasing, while the White Wagtail too probably is decreasing.

Of the 9 birds that are probably decreasing, mention should be made of the Alexandrian Parakeet which is well known to stay in one region for years, usually near an old monument. As the environs of Delhi get built up the species is likely to become rarer in Delhi; the Zoo, therefore, with its old monuments and relatively undisturbed surroundings, would appear to be an ideal home for these birds, and the apparant negative trend of this species therefore needs to be followed up closely. The Black Drongo, Rufous Backed Shrike, Magpie Robin and Tailor Bird are also among the birds that appear to be decreasing.

Having established the group of threatened species at the Delhi Zoo, let us try to establish the habitat, breeding and dietary requirements of these species. (section G of the Summary). Immediately apparent is the fact that 16 of the 19 species are land birds. 2 more belong to the A10 habitat (open

spaces near water), and in that sense are also land-based. Of these land based birds, 6 belong to the C15 habitat (garden habitat with small trees and bushes), 3 each to the B13 and B14, and 2 to B12 (all ridge habitats - see Appendix 1). In other words, the birds affected essentially belong to the garden habitat (C15), and a wide variety of ridge-type habitat (B12 to B14).

There is another interesting fact to be gathered. Look at the seasonal prevalence. The majority of the threatened birds are those found equally in both seasons, i.e. 12 species; the White Cheeked Bulbul was sighted only once (in the monsoon), 2 species are winter migrants, and 4 show a winter predominance. Of the latter, the Painted Stork is known to have bred in the Zoo, and the Redwhiskered Bulbul too has bred here in the past; thus, 15 of the 19 threatened species breed/have bred in the Zoo, and the majority are birds that stay here through out the year.

Among the water-birds, only the Painted Stork has shown declining numbers. Why this bird alone, and none of the other birds of the A5 habitat? It is interesting to look at the other birds preferring this (A5) habitat. It is seen that habitat A5 (shallow sloping shore), is poorly represented in the Zoo, with only 7 of the 17 species seen in Delhi being seen here, and only the Painted Stork seen more than once in all the counts. And that too is now on the decline! However, it is prudent to add that as this bird comes to the Zoo mainly to breed and feed, the factor leading to its decline may be related to either a change in the food available, or to its breeding, rather than its habitat requirement.

Now let us examine the nesting requirements of the threatened birds (section G of Summary). It is seen that only 2 birds are winter migrants, and so do not concern us here. Of the remaining 17 species, it is remarkable that 11 species nest in sites B9 to B11 (bushes, small and large trees respectively). Two others that may be decreasing breed in habitat B12 (Monuments/buildings). Only the Painted Stork, Green Bee Eater, and Stone Curlew, breed in the vicinity of water. Interesting too is the fact that 7 of the 19 species breed in small trees, easily within the reach of people. Could disturbance by the public be the cause of less successful breeding, and thereby a decline in numbers of these species?

Finally, looking at the feeding requirements of the threatened birds, it is interesting to note that 15 of the 19 endangered species (80%), eat insects as their primary diet. Two other species eat them as a secondary diet. Only the Painted Stork (eats fish, frogs, etc.) and Alexandrian Parakeet (fruits and grains), do not eat insects primarily. Contrast this with the overall feeding habits of all the Zoo's birds - only 43% have insects as their primary diet, and another 18% take them secondarily, making the total 61% versus 89% in the threatened group. Also of great interest, all the species yet seen in the Zoo that consume flower nectar as their primary or associated diet, are decreasing. These birds are the Purple Sunbird, White Cheeked Bulbul, Magpie Robin, Tailor Bird and the Black Drongo.



# NATIONAL ZOO : SUMMARY OF BIRD COUNT ANALYSIS

## A) COUNT DATA :

	Winter	Monsoon	Total
Number of Counts done/results available :	5	6	11
Total hours taken during counts :	16.3	16.3	32.6
Average time per count (hours):	3.3	2.7	3.0

## B) THE BIRDS

	Winter	Monsoon	Wn/Mo	Overall
Species of land birds seen :	58	50	1.2	70
Species of water birds seen:	27	22	1.2	31
Species of birds-of-prey seen:	4	3	1.3	4
Number of species seen overall :	89	75	1.2	105
Average number of species/count :	49	44	1.1	47

Significant species for which area is of primary importance :

1. R' Whiskered Bulbul	4. Stone Curlew	7. Night Heron	10. Nakt
2. Alexand. Parakeet	5. Cormorant	8. Indian Moorhen	
3. Grey Hornbill	6. Painted Stork	9. W' Breast Waterhen	

## C) THE NUMBERS OF BIRDS.

	Winter	Monsoon	Wn/Mo	Total
Number of land birds seen :	2729	2258	1.2	4994
Number of birds-of -prey seen :	231	265	0.9	496
Number of water-birds seen :	5164	2222	2.3	7373
Total of ALL birds seen :	8124	4745	1.7	12863
Average number of birds/count:	1625	791	2.0	1169
Birds sighted/hour of counting :	498	291	1.7	395

## D) NUMBERS OF THE INDIVIDUAL SPECIES

5 most numerous species ( in winter, monsoon & overall) :

Winter	Monsoon	Overall
1 Pintail	1. Blue Rock Pigeon	1. Pintail Duck
2 Blue Rock Pigeon	2. Night Heron	2. Blue Rock Pigeon
3 Shoveller	3. Cormorant	3. Spotbill
4 Spotbill	4. Spotbill	4. Shoveller
5 Common Myna	5. House Crow	5. Cormorant

## E) SEASONAL STATUS OF THE BIRDS

Species predominant in winter (including migrants) :	40
the monsoon :	29
Species seen equally in both seasons :	36

Number of species of known winter migrants : 23

Five most numerous known winter migrants

1. Pintail	3. Common Teal	5. Common Swallow
2. Shoveller	4. Warblers (all)*	

\*Variable migrant status.

Number of species locally migrant in winter : 4

Names of species :

1. Bank Myna(?)	3. Pied Wagtail
2. Painted Stork	4. Indian Wren Warbler(?)

# AREA NATIONAL ZOO (contd.)

Number of species of defined monsoon migrants :

Names of species :

1. Golden Oriole
2. W'Throated Munia

3. Koel
4. Mahratta W'Pecker

5. Night Heron
6. Cattle Egret

## F) STATUS OF THE BIRDS

Species with inaccurate counts :

9

Species sighted too infrequently for analysis :

44

Species seen with varying numbers :

8

Species with no change in numbers :

18

Species with probable decrease in numbers :

9

Names of these species :

1. Green Bee Eater

4. Magpie Robin

7. WireTail Swallow

2. Black Drongo

5. Bay Backed Shrike

8. White Wagtail

3. Alexand. Parakeet

6. Tailor Bird

9. Crag Martin

Species with definite decrease in numbers :

10

Names of these species :

1. Painted Stork

5. Rfs' Backed Shrike

8. Redvented Bulbul

2. W'Cheeked Bulbul

6. Stone Curlew

9. Redstart

3. R'Whiskered Bulbul

10. Golden Back Woodpecker

7. Purple Sunbird

4. Ashy Wren Warbler

Species with probable increase in numbers :

6

Names of these species :

1. Nakta

3. Large Egret

5. W'Throated Munia

2. Spotbill

4. Peafowl

6. Mahratta Woodpecker

Species with definite increase in numbers :

1

Names of these species :

1. Grey Hornbill

## G) ANALYSIS OF THREATENED BIRDS

Habitat preference :  
(Numbers of birds)

Water,	Land	Man-made
3	8	8

Nesting sites preferred:  
(Numbers of birds)

1	14	2
---	----	---

\* Two species are winter migrants and do not breed here

Diet consumed :  
(Numbers of birds)

Animal origin	Vegetable
15 .. Insects	1 .. Berries
1 .. Fish	1 .. Nectar
	1 .. Fruit

Seasonal Status (Numbers of Birds).

Winter	Equal	Monsoon
Predominant Migrant		Predominant Migrant
4	12	1
2		0



## ANALYSIS OF THE BIRD COUNTS AT ISBT/JAMUNA.

### INTRODUCTION.

The Interstate Bus-stop / Jamuna area was included in the Kalpavriksh bird-counts since monsoon 1981. This area consists of the water-front area of the Jamuna, adjoining the ISBT. The count route passes through the lawns adjoining this bank of the river, and is interrupted by a large area of settlement where a regular colony adjoining the Ghats exists. The route then passes over a short stretch of water, onto an island in the river. Here are large patches of reeds, and an entirely different population of birds than those seen on the bank of the river exists. Also seen on this island are fields where agriculture is regularly practiced. In recent years, the initial area of the route has been destroyed due to the construction of the trans-Jamuna bridge in this area, but the greater part, including the island, is intact.

It is the wide variety of habitats, and the concentrations of water-fowl in this area, that lend support to the area being included in the counts. Since their inception here, 12 counts have been done. Only the data concerning the monsoon '86 count is misplaced. Based on the results available, analysis has been attempted, the results of which follow.

### THE BIRDS OF ISBT/JAMUNA.

In the 12 counts mentioned above, 98 species of birds have been identified in this area (See section B of the Summary). Of these, 58 were land-birds, 3 birds-of-prey, and the remaining 37 species, water-birds. The number of species documented in this area, then, are less than both the other mixed habitat areas, with the Rajghat/Jamuna area having 121, and the Zoo 105 species. Note should be made of the fact that in this area, and Rajghat, the number of water-birds is similar, and the difference in the number of species seen, is primarily due to the difference in the number of species of land-birds, with 74 seen in the Rajghat area. The paucity of land-bird species is in part due to the excessive human presence in this area; even to a casual observer, it is clearly greater here than in the other areas discussed. Additionally, both Rajghat and the Zoo provide a greater land area, as well as a greater variety of land related habitats. Recently, of added significance, are the new constructions in the ISBT area mentioned above, causing further disturbances in the available land-area in the ISBT region.

The number of species seen in the winter counts was slightly greater: 80, verses 75 in the monsoons. The average number of species seen in the winter counts, was however, much greater than the average seen in the monsoon: 41 (range 30 to 47) verses 32 (range 19 to 38). This means, that though the total number of species is not very different in the 2 seasons, yet the different species are seen more frequently in the winters, ie. a greater number of local birds show a winter predominance. We will return to this later, and see whether this assumption withstands further analysis.

## THE NUMBERS OF BIRDS AT ISBT / JAMUNA.

Moving on now to the overall numbers of birds (not species) in the winter verses monsoon counts, we come up against some very interesting facts (Section C of Summary). Firstly, of note is the fact that the numbers of land-birds is larger in the monsoon : 2148 verses 1497. To some extent, the difference is due to the huge numbers of Blue Rock Pigeons (300), and House Crows (123), seen in the monsoon '81 count, as these numbers were not seen again. (Infact, in most subsequent counts, the Crows were purposely not recoded.) But even if these initially recorded numbers are excluded, the numbers are still greater in the monsoons overall.

But such is not the case with the numbers of water-birds. Here, 4871 (range 345 to 1654 birds) were seen in the winter, while a pathetic 332 (range 2 (?) to 110), were seen in all the monsoon counts. This huge difference is due primarily to the migrant Ducks, and, unlike the Zoo, the Gulls (also migrant). Infact, if these birds, (ie. the Brahmini, Pintail, Shoveller, Common Teal, and Gulls), are not counted, the numbers of all the remaining 24 species seen in the winter counts total 495 ! But due to the migrants, the totals of all the birds seen are also much greater in the winter - 6568 verses 2698.

As discussed above, the most numerous birds are the migrant Gulls and Ducks : Gulls (all), Shoveller, Common Teal, Pintail (see section D of Summary). Only the Blue Rock Pigeon is included with these birds among the first five. Next come the ubiquitous Common Myna, Pariah Kite, House Crow; and then the Bank Myna and Brahmini Duck, in descending order of their numbers. The overall numbers of the species shows that only 27% of the species were seen in numbers of more than 50, while 43% were seen in numbers less than 10 in all the counts together. The corresponding numbers for the Zoo, are 34% of species seen there in numbers < 50 birds and 39 % seen in numbers < 10 birds each. For Rajghat the corresponding figure is 30% & 38%, respectively. This means that not only are fewer species seen in the ISBT area, but also that the number of the majority of each individual species overall is less than in the Zoo and Rajghat.

## THE SEASONAL STATUS OF THE BIRDS OF ISBT/JAMUNA.

Let us now try to determine the distribution of the birds among the seasons (section E of the Summary).

It is seen that 34 species (33% of the total number of species), show a monsoon predominance (excluding the Blue Rock Pigeon, whose numbers are probably inaccurate), ie. their numbers are twice as many in the monsoon as compared to the winters. Birds with a winter predominance, on the contrary, number 43 (44%). Among these winter predominant birds, 21 are known winter migrants (see glossary for definition of known migrant). An additional three known winter migrants were seen either in both seasons equally, or paradoxically in the monsoon count, making a total of 24 known migrants. (In the Rajghat area, these number



32, in the Zoo, 23). Interestingly, therefore, our comments regarding the probably greater winter predominance of the birds of this region in an earlier section of this chapter (The birds of ISBT/Jamuna), is well borne out.

In addition to the known winter migrants, the Rose Ringed Parakeet, Baybacked Shrike and Green Pigeon, appear to be locally migrant in the winters. An additional 14 species may also be in this category, but the sightings or/and numbers are as yet insufficient to provide any conclusions.

What of the monsoon migrants to this area? Well, of these there are 8 species, all being at least 5 times commoner in the monsoon, and having sufficient sightings and numbers to permit conclusions. These are the Cattle and Little Egret, Streaked Weavers, Crow Pheasant, Pied Crested Cuckoo, Wren Warblers (all), and Green Bee-eaters. The Rosy Pastor maintains an interesting position in this regard, as although it is a known winter migrant, though arriving very early, it has never been seen in the winter, but always in the monsoons. It is, therefore, probably a passage migrant.

Of those birds that are seen in both counts more-or-less equally, there are 21 species (23% of total species). This compares with 19% of the total species seen equally in the two seasons in Rajghat, and 30% at the Zoo. These figures probably are a reflection of the human presence in the area; the greatest in the Zoo, less in the ISBT area, and least in the Rajghat area; for a greater human presence does provide undiminished food year-round for some species, and shelter in the form of buildings and planted trees, for others.

#### THE STATUS OF THE BIRDS OF ISBT/JAMUNA.

Section F of the Summary deals with the temporal trends shown by the various species during the count period. As seen, five species were not analysed due to doubts about their numbers or identification. These included the Blue Rock Pigeon, House Sparrow, Pariah Kite (difficult to count accurately), Terns (inconsistent sightings), and the Collared Bushchat (uncertain sighting). 43 species were sighted too infrequently to draw any conclusion. Another 12 showed varying numbers, with no definite change in their numbers. This left a group of 29 birds in which conclusions could be fruitfully drawn. Of these 29 species, 17 did not appear to show any appreciable change in their numbers. 2 seemed to have increased: these are the Common and Bank Mynas. The remaining birds, totalling 19 species, showed either a definite or possible decrease.

Though not dealt with separately in the Summary, it can be seen that both the species that showed a possible increase in their numbers (the Common and Bank Mynas), are very comfortable in the presence of humans, the first, infact, being a confirmed commensal with them.

Let us next deal with with the group of 19 threatened birds (see section G of the Summary). It is seen that 7 species showed a definite decrease in their numbers. Included among these are the Shoveller and Brahmini Ducks, Painted Stork and Grey Herons. Among the 12 birds that show a possible decrease, are the

Pond Heron, Little Egret, White Breasted Kingfisher, Black Drongo, Crow Pheasant, Tailor Bird and Grey and Yellow Wagtails.

The next section of the Summary (section F), deals with the habitats, nesting, diets and seasonal status of the threatened birds. Note that 13 (68%), belong to either water habitat (A1 to A9), or to open areas in close proximity to water (A10). 6 species are land based, with 3 of these belonging to the B13 habitat (open areas with few trees and possible cultivation). Also of note is the fact, that 5 of the 6 species that are definitely decreasing belong to the water-related habitat. Remembering that at Rajghat 54% of threatened species belonged to the water habitat, while only 16 % of those in the Zoo belong to this habitat, it can be safely stated that the water-habitat of the Zoo is relatively undisturbed, but much more disturbed in the Rajghat area, and is the worst off in the ISBT region of the Jamuna.

Moving onto the nesting requirements of the threatened birds; as discussed above, 7 species are winter migrants; these do not breed here, and need not concern us further in this section. Of the remaining 12, exactly half breed in a water-related site, and half in a land-related one. 4 of the former breed in sites A3 (trees adjacent to water), and one each in the A2 (reeds near water) and A5 (holes in river banks) sites. Of the ones breeding on land, 5 of the 6 breed in sites B9 to B12 (bushes, low and tall trees, respectively). However, none of these is definitely decreasing.

Looking at the dietary requirements of these birds, it is seen that the most important diet overall, is, as in the other areas, #1, ie. land insects, with 12 of the 19 (63%) partaking off this fare entirely, or as a major part of their diet. This is considerably less than the Zoo, where 84% of the threatened species eat this diet, or the Rajghat where the corresponding number is 75%. However, 7 species in this (ISBT) region take a primarily water-related diet; 5 taking fish & frogs etc. (diet #3), and 2 water vegetation (#6). None of the species consuming water insects and small water animals primarily, (#2), appears to be diminishing, though 3 do take this as an associated diet along with one of the two mentioned above. (Interestingly, The fact that birds consuming diets #'s 3 & 6, were decreasing, but not the ones consuming diet #2, was also noted in the Rajghat area.)

What of the seasonal status of these birds? Again in section F of the Summary, we see that fully 7 species (37%), are winter migrants. This is greater than the corresponding number in both the Zoo and Rajghat, showing that the migrants are worst off in this region. Infact, it is also of concern, that 5 of the 7 species showing a definite decrease, are known winter migrants. Another 4 species are monsoon migrants to the area; these are the Spotbill, Crow-pheasant, Pond Heron and Little Egret. Most of the threatened birds, therefore, are essentially winter or monsoon migrants to the area.



# ISBT/JAMUNA : SUMMARY OF BIRD COUNT ANALYSIS

A) COUNT DATA :	Winter	Monsoon	Total
Number of Counts done/results available :	6	6	12
Total hours taken during counts :	18.5	15.2	33.7
Average time per count (hours):	3.1	2.5	2.8

B) THE BIRDS	Winter	Monsoon	Wn/Mo	Overall
Species of land birds seen :	49	46	1.1	58
Species of water birds seen:	29	24	1.2	37
Species of birds-of-prey seen:	3	3	1.0	3
Number of species seen overall :	80	75	1.1	98
Average number of species / count	41	32	1.3	36

Significant species for which area is of primary importance :

1. Rosy Pastor	3. Streaked Baya	6. Common Teal
2. Wagtails (Grey, Pied, Yellow, White)	4. Brahmini Duck	7. Gulls (All)*
	5. Shoveller	8. Grey Heron

C) THE NUMBERS OF BIRDS.	Winter	Monsoon	Wn/Mo	Total
Number of land birds seen :	1497	2148	0.7	3645
Number of birds-of -prey seen :	200	218	0.9	418
Number of water-birds seen :	4871	332	14.7	5227
Total of ALL birds seen :	6568	2698	2.4	9290
Average number of birds/count:	1314	450	2.9	845
Bird sightings / hour of counting	355	178	2.0	276

## D) NUMBERS OF THE INDIVIDUAL SPECIES

5 most numerous species ( in winter, monsoon & overall) :

Winter	Monsoon	Overall
1 Gulls (all)*	Blue Rock Pigeon	Gulls (all)*
2 Shoveller	House Crow	Shoveller
3 Common Teal	Rosy Pastor	Common Teal
4 Pintail Duck	Common Myna	Blue Rock Pigeon
5 Blue Rock Pigeon	Pariah Kite	Pintail

## E) SEASONAL STATUS OF THE BIRDS

Species predominant in winter (including migrants) :	43
the monsoon :	34
Species present equally in both seasons :	21

Number of species of known winter migrants :	24
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Five most numerous known winter migrants

1. Brahminy Duck	3. Common Teal	5. Gulls (all)*
2. Shoveller	4. Pintail Duck	

Number of species locally migrant in winter :	3
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Names of species :

1. Rose Ringed Parakeet	2. Bay Backed Shrike	3. Green Pigeon(?)
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\*consisting of Brown & Blackheaded Gulls

AREA ISBT/JAMUNA (contd.)

SECTION G (contd.)

Number of species of defined monsoon migrants : 8

Names of species :

- |                    |                 |                        |
|--------------------|-----------------|------------------------|
| 1. Cattle Egret    | 4. Crowpheasant | 7. Little Egret        |
| 2. Streaked Weaver | 5. Ashy Wren    | 8. Green Bee Eater (?) |
| 3. Spotbill        | 6. Pond Heron   |                        |

F) STATUS OF THE BIRDS

Species with inaccurate counts : 5

Species sighted too infrequently for analysis : 43

Species seen with varying numbers : 12

Species with no change in numbers : 17

Species with probable decrease in numbers : 12

Names of these species :

- |                         |                           |                  |
|-------------------------|---------------------------|------------------|
| 1. Common Swallow       | 5. Spotbill Duck          | 8. Crowpheasant  |
| 2. Pond Heron           | 6. Black Drongo           | 9. Starling      |
| 3. Yellow Wagtail       | 7. W' Breasted Kingfisher | 10. Tailor Bird  |
| 4. White Backed Vulture | 8. Brahminy Myna          | 12. Little Egret |

Species with definite decrease in numbers : 7

Names of these species :

- |                  |                   |               |
|------------------|-------------------|---------------|
| 1. Shoveller     | 4. Warblers (all) | 7. Grey Heron |
| 2. Brahminy Duck | 5. Grey Wagtail   |               |
| 3. Painted Stork | 6. Crested Lark   |               |

Species with probable increase in numbers : 1

Names of these species :

1. Common Myna

Species with definite increase in numbers : 1

Names of these species :

1. Bank Myna

G) ANALYSIS OF ENDANGERED BIRDS

	Water	Land	Man-made
Habitat preference :	13	5	1
(Numbers of birds)			

Nesting sites preferred:	6	5	1
(Numbers of birds)			

\*7 species of birds do not breed in Delhi

Diet consumed :	Animal origin	Vegetable
(Numbers of birds)	9 .. Insects	2 .. Water Vegetation
	5 .. Fish etc.	1 .. Grass Seeds
	1 .. Carrion	1 .. Berries/Figs

Seasonal Status (Numbers of Birds).

Winter	Equal	Monsoon
Predominant Migrant		Predominant Migrant
1 7	5	2 4



## ANALYSIS OF THE BIRD COUNTS AT RAJGHAT/JAMUNA

### INTRODUCTION.

Rajghat/Jamuna is an area with varied habitats of open areas, fields, trees, marshy land, open river and reed beds, both close to water and remote from it. It is downstream to where the major canals of Delhi dump sewage into the Jamuna, and the Indira Gandhi Thermal Power Plant is located close to the area. Yet, here is where are seen a great many of the resident and migrant birds of Delhi, each occupying its own niche in this vast region of varied habitats; and inclusion of this area in any bird-watching exercise is, therefore, important.

Kalpavriksh, since 1982, has carried out 12 counts in this area. Infact, it is the only area where counts have been held, that the results of all the counts held since their inception in the area are available.

### THE BIRDS OF RAJGHAT/JAMUNA.

The Rajghat/Jamuna area has proved to harbour the greatest variety of bird-life among all the areas in Delhi where counts have been held. No less than 121 of the 177 species (69%) seen in all the counts, were seen in this area (See Section B of Summary). Of these 74 were land-birds, 6 birds-of-prey, and 41 water-birds. These represent 73%, 40% and 70% respectively of the birds seen in all the counts, to date. Compare this to the area with the 2nd largest number of species registered; the National Zoo. Here a total of 105 species were seen in the same number of counts, of which 70 were land-birds, 4 birds-of-prey and 31 water-birds. A poor third is ISBT/Jamuna with 98 species sighted in 13 counts, of which 37 were water-birds. It is apparant, therefore, that the superiority of this area as regards the numbers of bird-species seen, is due to the greater numbers of birds belonging to both the land and water habitats.

As to the numbers of species seen during the two seasons, it is seen that 95 were seen in all the winter counts, and 94 in all the monsoon counts. The average number of species per count was also slightly greater in the winters : 57 verses 52.

### THE NUMBERS OF THE BIRDS OF RAJGHAT/JAMUNA.

The overall numbers too, were slightly more in the winter with 4534 birds seen, as compared to 3234 in the monsoon. Taken seperately too, the numbers of land birds and water birds are each greater in the winter: 2505 verses 2362 for the land birds, and 1,791 in winter compared to 749 in monsoons, for the water birds.

However, the superiority in numbers of species, noted in the earlier section, does not translate into a superiority of numbers of birds sighted, when compared to other areas. Infact, with a total of 7,763 birds seen in 12 counts, the area falls behind both the Zoo, and ISBT, where 12,863 and 9,290 birds respectively were seen. This interesting difference is due to the

much fewer numbers of water-birds seen in Rajghat : 2,540 here, compared to 7,373 birds seen at the Zoo, and 5,227 at ISBT. In turn, the lesser numbers of water-birds are due to a much smaller number of migrant ducks frequenting this area.

This fact is clearly seen when the birds are arranged in order of their numbers seen (see section D of Summary). It is then seen that none of the known migrant water fowl are included in the 5 most numerous birds. Indeed, of the 15 most numerous species, the only known winter migrant is the Shoveller Duck. Of this species too, only 297 birds were seen, and 256 of these were seen in winter '82 ! Suffice it to say, that many more migrant ducks (more than 3,000 birds) were seen in both the Zoo and ISBT counts. One wonders why the Jamuna can support many times the numbers of migrant ducks at ISBT, which is only a short distance upstream from the Rajghat area ?

But if (section D of Summary) shows that migrant ducks are not numerous here, it also shows the birds that are; witness the huge numbers of Bank Mynas, Red Wattled Lapwings and Pied Mynas, (all in the 5 most numerous species), all far in excess of all the other areas where they were seen. The Blue Rock Pigeon and Cattle Egret, the latter also seen in excess of other areas, are the other birds among the most numerous five.

Also of note is that 8 of the 20 most numerous species belong to the A10 habitat (open spaces near water), compared to 3 at ISBT, and 1 at the Zoo. Another 5 are commensal with humans, and only 2 species (the Shoveller and Common Teal) live in the water primarily. In the Zoo and ISBT, 5 of the 20 most numerous species inhabit the water-habitat primarily.

It would be safe to say that should the open spaces in this area be 'developed', it would spell disaster for about 15 species of birds, including 6 species of Swallows, 4 species of Wagtails, and Starlings, all of which are much more numerous here than in other areas; the populations of the Red Wattled Lapwing and Pied Myna would also be decimated in this region, but as these birds are much more adaptable, this is of less concern. The Marsh Harrier, seen regularly for the first 4 counts, already appears to be on the decline, and in addition, the White Tailed Lapwing, and Greylag Goose, both seen occasionally in this area, would be lost forever from this area.

Another interesting fact to be noted, is that 36 species (30%) were seen in numbers of more than 50, and 45 (38%) in numbers < 10. In the other areas with mixed water and land habitats, ie. the Zoo and ISBT, the corresponding figures are 26 (27%) and 42 (43%) for ISBT, and 35 (34%) and 41 (39%) for the Zoo. This means that although the most numerous species in Rajghat have far fewer numbers than the most numerous species in either the Zoo or ISBT, yet the numbers of all species in general, is similar. Once again it is seen that the much fewer numbers of birds in Rajghat are related to only a few species, eg., as mentioned above, the migrant ducks.

#### SEASONAL STATUS OF THE BIRDS OF RAJGHAT/JAMUNA.

Turn now to (Section E of Summary). In this the seasonal



prevalance of the birds in Rajghat has been summarised. Note that fully 52 species, or 43% of the total species have a monsoon predominance; and 47 species, or 36% of the total species, are predominant in winter. This leaves only 22 species, or 19%, that are prevalent in similar numbers throughout the year. This group includes all the 5 most numerous birds; the Blue Rock Pigeon, Bank and Pied Mynas, Red Wattled Lapwing and Cattle Egret. Thus, over 80% of the species seen here show a marked seasonal predominance.

32 species are known winter migrants to this area. This is by far the largest number of migrants seen in any of the areas so far. However, note that several of the known winter migrants were seen more predominantly in the monsoons (eg. the Spotted and Green Sandpipers, Redshank and Rosy Pastor. This paradox may be explained by i) the bird being an early passage migrant in Delhi, eg. the Rosy Pastor, ii) stragglers from last year, or early migrants finding this region satisfactory at this time, and later in the year dispersing to other areas, so that fewer numbers are noted in the winter counts.

In addition to these, several birds are so much commoner in the winters here, that to call them locally migrant in winter would not be amiss. These birds are the Painted Stork, Purple Sunbird, and the Brahmini Myna. Several other species, eg. Coots, Yellow Wattled Lapwing, Green Pigeon and Spotbill, may also be in this category, but their status needs confirmation.

The birds that may be stated to be monsoon migrants to this area (ie. monsoon numbers are 5 times those in the winter), are : the Pheasant Tailed Jacana, Black Headed Munia, Green Barbet, Indian Hawk Cuckoo, White Breasted Waterhen, Sand Martin, Green Bee Eater, Purple and Pond Herons. In addition, about 25 other species fulfil the criteria mentioned above, but due to insufficient sightings, or other reasons, such a status cannot be given to them as yet.

#### STATUS OF THE BIRDS OF RAJGHAT/JAMUNA.

Based on the data from the 12 counts, an attempt was made to decide whether there were any changes in the population of the various bird species. Listed in (section F of Summary), is a summarization of the results obtained.

From this section, it is seen that 52 species were seen too infrequently to allow any definite conclusions. 7 species had large variations in their numbers, with no definite change in their numbers. Another 4 were not analysed as they are difficult to count accurately (the House Crow and Sparrow, Pariah Kite and White Backed Vulture). This left a group of 58 species for which analysis could be fruitfully attempted.

Among this group, 28 species did not show any appreciable change in their numbers. 7 species showed a probable, or definite increase in their numbers. These are the Red Wattled Lapwing, Cattle Egret, Pied Bushchat, Indian Wren Warbler, Wren-Warblers (others), Spotbill, and the Redshank. The remaining 24 birds showed a probable, or definite decrease in their numbers. Let us examine this subgroup in greater detail.

Section F of the Summary lists also the birds that are, or probably are, decreasing. As noted above, there are 24 such species, of which 9 appear to be definitely on the decline, and the remaining probably so. Included in this group of 24 birds are all the ducks, other than Spotbills, which were seen more than once, thus allowing an inference to be drawn. These are the Pintail, Shoveller, Common Teal and Tufted Pochard. Also decreasing among the water-birds are the Large Egret, Painted Stork, Pheasant Tailed Jacana and the White Breasted Kingfisher. The Marsh Harrier, seen regularly in small numbers in the first 5 counts, has not been seen since monsoon '84. This is especially tragic as this species has not been spotted in any of the other areas in Delhi.

Let us turn our attention to section G of the Summary. Note that over half of the threatened species (54%, to be exact) belong to the water habitat, albeit 6 to areas in close proximity to water (the A9 & A10 habitats - bushes and reeds adjoining water, and open spaces in the neighbourhood of water respectively). The majority of the remaining species prefer either the B14 habitat (open spaces with interspersed trees), or the garden habitats (C15 & C16).

What of the nesting requirements of these birds? Here it is seen that 7 species are known winter migrants, and do not breed here. The remaining breed in a variety of sites; 4 in trees (B10 & 11), 4 in bushes (B9), 3 in scrub country (B7), and 2 in buildings (B12). The remaining three species breed in a variety of water-related sites.

As to the dietary requirements, 18 of the 24 threatened species (75%), feed on insects either as their only diet, or as a major part of it. Included among these are birds frequenting the A10 habitat (open spaces in the vicinity of water). The threatened birds found usually in water (eg. ducks), consume mainly fish, frogs, etc., or water vegetation (diets 3 & 6). Interestingly, there are only 8 species among the 58 in which an attempt at analysis was made, which consume primarily diet #3 : and 4 of these are decreasing ! A fifth, the purple heron, though not included in this group, may well be headed in the same direction. Similarly, 4 of the 6 species consuming water vegetation appear to be decreasing. However, birds consuming diet #2 (water insects and small water animals), are not affected in the same way, with only 2 of the 9 species analysed appearing to be decreasing. Both of these two, however, eat also diet #3 (the Shoveller), or diet #6 (the Tufted Pochard), so that their decrease may actually be related not to diet #2, but to the other major diet which they consume (#3 & 6, respectively for each species). Infact, 2 birds consuming diet #2 appear to be increasing - the Red Wattled Lapwing, and Redshank.



# RAJGHAT : SUMMARY OF BIRD COUNT ANALYSIS

## A) COUNT DATA :

	Winter	Monsoon	Total
Number of Counts done/results available :	6	6	12
Total hours taken during counts :	22.5	25.6	48.1
Average time per count (hours):	3.8	4.3	4.1

## B) THE BIRDS

	Winter	Monsoon	Wn/Mo	Overall
Species of land birds seen :	56	63	0.9	74
Species of water birds seen:	35	25	1.4	41
Species of birds-of-prey seen:	4	6	0.7	6
Number of species seen overall :	95	94	1.0	121
Average number of species / count	57	52	1.1	54

Significant species for which area is of primary importance :

1. Bluethroat	9. Common Swallow	16. Pochards (Common R' Head, Tufted)
2. Collared Bushchat	10. Sand Martin	
3. Pied Bushchat	11. Wagtails (Pied, Grey, Yellow, White)	17. Avocet
4. Scarlet Minivet	12. Marsh Harrier	18. Pied Kingfisher
5. Blackheaded Munia	13. Little Bittern	19. Sandpiper (Common, R' Shank, Spotted)
6. Whitebacked Munia	14. Dabchick	
7. Indian Roller	15. Purple Heron	
8. Grey Shrike		

## C) THE NUMBERS OF BIRDS.

	Winter	Monsoon	Wn/Mo	Total
Number of land birds seen :	2505	2362	0.8	4867
Number of birds-of -prey seen :	238	123	1.0	361
Number of water-birds seen :	1791	749	1.7	2540
Total of ALL birds seen :	4534	3234	1.4	7768
Average number of birds/count:	756	539	1.4	647
Birds Sighted/hours of counting :	202	126	1.3	171

## D) NUMBERS OF THE INDIVIDUAL SPECIES

5 most numerous species ( in winter, monsoon & overall) :

Winter	Monsoon	Overall
1 Shoveller	Bank Myna	Blue Rock Pigeon
2 Blue Rock Pigeon	Blue Rock Pigeon	Bank Myna
3 Starling	R' Wattled Lapwing	R' Wattled Lapwing
4 R' Wattle Lapwing	Pied Myna	Pied Myna
5 Bank Myna	Sand Martin	Cattle Egret

## E) SEASONAL STATUS OF THE BIRDS

Species predominant in winter (including migrants) :	47
the monsoon :	52
Species seen equally in both seasons :	22

Number of species of known winter migrants : 32

Five most numerous known winter migrants

1. Shoveller	3. Yellow Wagtail	5. Common Swallow
2. Starling	4. White Wagtail	

Number of species locally migrant in winter : 3

Names of species :

1. Painted Stork	2. Purple Sunbird	3. Brahmani Myna
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AREA RAJGHAT/JAMUNA (contd.)

SECTION G (contd.)

Number of species of defined monsoon migrants :

11

Names of species :

1. Pheasant-tail Jacana
2. Black-headed Munia
3. Green Barbet
4. Indian Hawk Cuckoo

5. Sand Martin
6. W. Breast Waterhen
7. Purple Heron
8. Green Bee Eater

9. Pond Heron
10. Little Egret(?)
11. L. Ring Plover(?)

F) STATUS OF THE BIRDS

Species with inaccurate counts :

4

Species sighted too infrequently for analysis :

52

Species seen with varying numbers :

7

Species with no change in numbers :

28

Species with probable decrease in numbers :

15

Names of these species :

1. Shoveller
2. Black Drongo
3. White Wagtail
4. Common Teal
5. Tufted Pochard

6. Red Munia
7. Pipits (All)
8. Indian Hawk Cuckoo
9. Scavenger Vulture
10. W. Breast Kingfisher

11. L. Grey Babbler
12. Blackhead Munia
13. Painted Stork
14. Magpie Robin
15. Lark, Others

Species with definite decrease in numbers :

9

Names of these species :

1. Sand Martin
2. Pintail Duck
3. Warblers (All)

4. Pheasant-tail Jacana
5. Indian Robin
6. Jungle Babbler

7. Indian Roller
8. Large Egret
9. Marsh Harrier

Species with probable increase in numbers :

6

Names of these species :

1. Cattle Egret
2. Pied Bushchat

3. Indian Wren Warbler
4. Wren Warbler (Others)

5. Spotbill
6. Red Shank

Species with definite increase in numbers :

1

Names of these species :

1. Red Wattled Lapwing

G) ANALYSIS OF THREATENED BIRDS

	Water	Land	Man-made
Habitat preference : (Numbers of birds)	13	7	4

	Water	Land	Man-made
Nesting sites preferred: (Numbers of birds)	4	11	2

\*Seven species do not breed in India.

Diet consumed :  
(Numbers of birds)

Animal Origin  
11 .. Insects  
4 .. Fish etc.  
3 .. Others

Vegetable  
3 .. Grass Seeds  
2 .. Water Plants  
1 .. Crops & Seeds

Seasonal Status (Numbers of Birds).

	Winter	Equal
Predominant Migrant	5	6

	Monsoon
Predominant Migrant	5



## ANALYSIS OF THE BIRD COUNTS AT LODHI GARDENS.

### INTRODUCTION.

The Kalpavriksh Bird-Counts in Lodhi Gardens began in January, 1981. Of the counts done since then the results of 11 are available for analysis, while no data is available for the monsoon 84, winter 85, and monsoon 86 counts.

Lodhi Garden was included in the initial counts because it represented a stable, albeit man-made, habitat, which was known to harbour a large number of birds fond of the Garden habitat; the monuments of this park also harboured species that were intimately associated with them. Add to this its central location, and safe surroundings and you have an area closely fulfilling the requirements we needed for selecting areas for the bird counts.

Note should immediately be made of the fact that there was an inadvertant change in the route being followed, probably after the first year or two. This appears to have resulted from the fact that no route-maps were provided consistently to the participants. Infact, the fact that the route had been greatly altered was not noticed till the monsoon '87 count, when it was decided to continue along the most recent route. This fact should be kept in mind during the following analysis, though the effect of this change in the route being followed is obviously difficult to assess.

### THE BIRDS OF LODHI GARDENS

During the 11 counts mentioned above, a total of 76 species of birds were identified. Of these, 61 were land birds, and 6 were birds-of-prey. The remaining 10 species were water-birds. Clearly, therefore, the Gardens harbour primarily land birds; the few water-birds owe their existence here to the man-made body of water that exists at one end of the Gardens. But certainly the sighting of Spotbills, White Breasted Waterhens, and 3 types of Kingfishers (including the Storkbilled !) adds interest to this area (See section B of the Summary).

But as mentioned above, it is the birds frequenting gardens that abound here. Witness, for example, the sightings of 3 species each of Parakeets, Flycatchers and Doves, Green Pigeons, Purple Sunbirds, Golden Orioles and the Golden Backed Woodpecker; but of even greater significance is the fact that this is the one place in Delhi that the Red Whiskered Bulbul is still to be found consistently ( see pages 7 & 48, Vol.2 of analysis).

The numbers of species sighted in each count, varied from 23 to 50. Interestingly, the numbers of species sighted were more during the monsoon counts, ranging from 31 to 44, while in winter this was only 23 to 34. Overall too, 58 species were seen in the monsoons, and 50 in the winter. This may be partly explained by the fact that many of the known winter migrants eg. the leaf warblers, are difficult to identify, and have therefore been grouped under one heading - 'warblers'.

## THE NUMBERS OF BIRDS OF LODHI GARDENS.

It is also of note that not only are bird species more plentiful in the monsoon, but they are also considerably more numerous: 2704 verses 2139 (section C of Summary). This difference in numbers, is clearly, due to an increase in the land birds, (2468 in monsoon verses 1901 in winter), while there is minimal change in the numbers of the birds-of-prey, and a mild excess in winters of the water-birds. In each monsoon count more than 350 land-birds were seen, while this number was reached in only 2 of the 6 winter counts. It would appear, therefore, that the Gardens are especially attractive to birds in the monsoons, while winter migrants are less attracted.

What of the numbers of individual species?

Section D of the Summary lists the commonest 5 birds seen in the winter, monsoon and overall. It is immediately seen that the commonest birds are commensals with humans (habitat C18); the Common Myna, Blue Rock Pigeon, House Crow and House Sparrow. Only the Rose Ringed Parakeet (second most numerous bird), does not fall in this category. Looking at the 10 most numerous birds, (not given in the Summary), it is seen that 9 of them are either commensal with humans, or prefer the garden habitat (habitat C 15).

Also of interest is the fact that only 38 of the 76 (ie. 50%) species were seen in numbers of more than 10 in all the 11 counts combined. And 25% were seen in numbers less than 5! However, if one keeps in mind the relatively small size of the Gardens (14 hectares), then these small numbers may still indicate a relatively high density of the birds.

Notable also is the observation that 70% of the total birds (numbering 3416 individuals) belong to the 10 most numerous species; 90% (4387 birds) to the 25 most numerous!

## SEASONAL STATUS OF THE BIRDS OF LODHI GARDENS.

When the birds are listed according to their relative numbers in the winters verses the monsoons, (summarised in section E of the Summary), it is seen that commensurate with our earlier comments about the increased numbers of bird species and numbers in the monsoons, 37 or 50% of the species (totalling 1039 birds) are 2ce as common in the monsoons as they are in the winter. On the other hand only 481 birds of 24 species (30% of the total number of species), are 2ce as common in the winters as in the monsoon. The remaining birds are present in similar numbers in both seasons, and belong to 16 species numbering 3323 birds.

Of the birds that can be stated to be monsoon migrants to the Gardens, the Copper Smith, Koel, Golden Oriole, Large Green Barbet, Green Pigeon, Baya Weaver, Treepie, Black Drongo and, surprisingly, the House Swift are most certain. The status of the Common Babbler, sighted 10 times as much in the monsoon according to our figures, is unclear as there may be an error in the recording of this species. The figures for the House Sparrow are, undoubtedly, inaccurate. 20 other species that may be monsoon migrants, were seen too infrequently to draw any



conclusions.

As to the winter migrants, only 11 species were seen which are known migrants from abroad. Of these, the Warblers (all), Redbreasted Flycatcher, Redstart and White Wagtail were the most numerous, seen in numbers of 24, 9, 7 & 7, respectively. Species that appear to be locally migrant in winters (Wn/Mo ratio > 5), are the Red Wattled Lapwing, Pied Wagtail and Pipits (all).

Also to be noted, is the fact that of the 10 species of water-birds, only the Red Wattled Lapwing is commoner in the winters; the Cattle Egret is present in similar numbers in the two seasons, while all the remaining water-birds are at least 2ce as common in the monsoons. This is, of course, not surprising, and is true for most areas consisting primarily of land related habitats.

#### THE STATUS OF THE BIRDS OF LODHI GARDENS.

Of the 76 species of birds seen in Lodhi Gardens during the 11 counts spanning 7 years, 36, or nearly one half of the species seen, were seen too infrequently to allow any inferences as to the changes, if any, in their prevalence. Another 5 species showed uneven fluctuations, with no definite trends, 5 species were either recorded inconsistently (eg. house crows and sparrows), or are difficult to count accurately (eg. pariah kites and vultures). This leaves a group of 31 species in which analysis could be fruitfully attempted. (See Table 4, section F of Summary).

Among the 31 species mentioned above, the majority, 15, showed no change in their numbers/prevalance. Of the remaining, 4 showed a definite negative trend in their numbers, and 9 a probable decrease in their numbers. 3 species displayed a probable increase; these are the Red Whiskered Bulbul, Golden Oriole and House Swift. Though not dealt with separately in the Summary, it can be seen that two of these thriving birds belong to the garden habitat; the third (House Swift), lives in old monuments, but counting the species is fraught with difficulty, because of its habit of flying all around rapidly. Any apparent increase in its numbers must, therefore await confirmation.

Let us now examine the threatened species (ie. the ones showing a negative trend in their numbers) more closely. Section F of the Summary deals with these 13 species. Here it is seen that the birds with a definite negative trend are the Purple Sunbird, Brahmini Myna, White Eyes and the Indian Robin. Among those with possibly decreasing numbers, are the Black Drongo, Treepie, White Breasted Waterhen, Redstart and Bluethroat. Of these birds, only the first three mentioned were seen in large numbers; the remaining were all seen at least thrice, but in numbers less than 25 in all counts included.

But what of the seasonal status of these birds? A summary of this is provided in section G of the Summary. It is seen that each of the birds threatened, except for the Indian Robin and Black Drongo, is either a winter migrant or predominant in winter, (4 and 1 species, respectively), or a monsoon migrant

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(6 species). In other words, nearly 22% of the birds predominant in the winters, and 18% of the monsoon predominant ones are affected. Of interest is the fact that only 2 of 18 birds present more-or-less equally in both seasons (the Indian Robin, and Black Drongo), or only 11% of the total, are affected. It would appear, then, that those birds using the Gardens primarily for one season, are the ones affected. The possible reason for this is, however, unclear.

Looking at the habitat requirements of these birds, (section G of Summary), note that 3 of them prefer habitats related to water. Recalling that the total number of species seen here that prefer this habitat are only 10, the number acquires significance: 1/3 rds of the water birds are threatened! 5 of the remaining 10 species belong to the man-made habitats of C15 (garden habitat with few trees and small plants), and C16 (garden habitat with groves of tall trees). 3 belong to the B14 habitat (open spaces with interspersed trees and possible cultivation). The total number of species identified in the counts overall belonging to each of these habitats are 14, 7, and 16 respectively.

Looking now at the nesting habits of the birds it is seen that 4 of the threatened birds are winter migrants, and therefore do not concern us here. Of the remaining 9 species, 6 breed in low or tall trees, and one more (the brahmini myna), in man-made structures. The Indian Robin breeds in area B7 (scrub country with stones and small bushes), while the 2 remaining (White Breasted Waterhen and the Green Bee-eater) breed close to water.

What of the feeding habits of these birds? Here it is seen that 6 of them eat only insects, 8 eat insects as the major part of their diet, and 11 take them as the major and associated diets. This compares with 34 species that eat insects among all the birds observed, 19 consuming only insects. 2 of the 12 species seen which consume berries and figs, and 1 each of those eating diet #'s 10 & 11 (flower nectar and fruits, respectively), are decreasing. Birds consuming grass seeds are unaffected, these species totalling 5. Birds taking a diet of animal origin (other than insects, which have already been considered) are poorly represented in the Gardens, and need not be discussed here.

In summary, the birds primarily affected are those consuming insects (33%), and some of those consuming berries and figs (20%).

# LODHI GARDENS : SUMMARY OF BIRD COUNT ANALYSIS

A) COUNT DATA :	Winter	Monsoon	Total
Number of Counts done/results available :	6	5	11
Total hours taken during counts :	16.6	13.1	29.7
Average time per count (hours):	2.8	3.3	3.0

B) THE BIRDS	Winter	Monsoon	Wn/Mo	Overall
Species of land birds seen :	41	45	0.9	61
Species of water birds seen:	5	9	0.6	10
Species of birds-of-prey seen:	4	4	1.0	6
Number of species seen overall :	50	58	0.9	77
Average number of species / count	28	35	0.8	31

Important species for which area is of primary importance :

1.Redwhiskered Bulbul	4.Magpie Robin	7.Golden Oriole
2.Greyheaded Flycatcher	5.Goldenback Woodpecker	8.Green Pigeon
3.Redbreasted Flycatcher	6.Pied Wagtail	

C) THE NUMBERS OF BIRDS.	Winter	Monsoon	Wn/Mo	Total
Number of land birds seen :	1901	2468	0.8	4369
Number of birds-of -prey seen :	59	44	1.3	103
Number of water-birds seen :	179	192	0.9	371
Total of ALL birds seen :	2139	2704	0.8	4843
Average number of birds/count:	357	541	0.7	440
Birds sighted /hour of counting :	129	206	0.6	163

## D) NUMBERS OF THE INDIVIDUAL SPECIES

5 most numerous species ( in winter, monsoon & overall) :

Winter	Monsoon	Overall
1 RoseRing Parakeet	Common myna	Common myna
2 Common myna	House Crow	RoseRing Parakeet
3 BlueRock Pigeon	RoseRing Parakeet	BlueRock Pigeon
4 House Crow	BlueRock Pigeon	House Crow
5 Pariah Kite	House Sparrow	Pariah Kite

## E) SEASONAL STATUS OF THE BIRDS

Species predominant in winter (including migrants) :	24
the monsoon :	37
Species present equally in both seasons :	16

Number of species of known winter migrants : 11

Five most numerous known winter migrants

1.Warblers (All)*	3.Common Swallow	5.Redstart
2.R'Breasted Flycatcher	4.White Wagtail	

\*Some species of Warblers are resident in Delhi.

Number of species locally migrant in winter : 3

Names of species :

1.Red Wattled Lapwing	2.Pied wagtail	3.
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AREA Lodhi Gardens (Cont.)

SECTION G (contd.)

Number of species of defined monsoon migrants : 9

Names of species :

- |                  |                 |                    |
|------------------|-----------------|--------------------|
| 1. Coppersmith   | 4. Green Pigeon | 7. Treepie         |
| 2. Koel          | 5. Green Barbet | 8. Black Drongo    |
| 3. Golden Oriole | 6. Baya Weaver  | 9. House Swift (?) |

F) STATUS OF THE BIRDS

Species with inaccurate counts : 5

Species sighted too infrequently for analysis : 36

Species seen with varying numbers : 5

Species with no change in numbers : 15

Species with probable decrease in numbers : 9

Names of these species :

- |                         |                           |                  |
|-------------------------|---------------------------|------------------|
| 1. Coppersmith          | 4. Black Drongo           | 7. Redstart      |
| 2. Green Bee Eater      | 5. R' Breasted Flycatcher | 8. White Wagtail |
| 3. W' Breasted Waterhen | 6. Treepie                | 9. Bluethroat    |

Species with definite decrease in numbers : 4

Names of these species :

- |                   |                  |
|-------------------|------------------|
| 1. Indian Robin   | 3. Brahmini Myna |
| 2. Purple Sunbird | 4. White Eye     |

Species with probable increase in numbers : 3

Names of these species :

- |                      |                  |               |
|----------------------|------------------|---------------|
| 1. Red vented Bulbul | 2. Golden Oriole | 3. Bluethroat |
|----------------------|------------------|---------------|

Species with definite increase in numbers : 0

Names of these species :

None

G) ANALYSIS OF ENDANGERED BIRDS

	Water	Land	Man-made
Habitat preference :			
(Numbers of birds)	3	5	5

	Water	Land	Man-made
Nesting sites preferred :*	2	6	1
(Numbers of birds)			

\*Four species do not breed in India.

	Animal origin	Vegetable
Diet consumed :		
(Numbers of birds)	8 .. Insects	2 .. Berries & Figs
	1 .. Water Insects	1 .. Flower Nector
		1 .. Fruit

Seasonal Status (Numbers of Birds).

	Winter	Equal	Monsoon
	Predominant Migrant		Predominant Migrant
	2      4	1	2      4

## ANALYSIS OF THE BIRD COUNT AT THE DEER PARK

### INTRODUCTION.

The Deer Park, situated in the heart of South Delhi, consists of a large man-made forest, and gardens. A few ponds provide water where some water-birds are frequently seen. In order to study the avian inhabitants of this largely man-made habitat, (which may soon become one of the few remaining large habitat-areas for birds in South Delhi), because it is likely to remain largely unchanged, and because it is conveniently located, it was included in the bird-counts since monsoon 1981. Unfortunately, the results of only 9 counts since their inception in this area are today available for analysis. Results of the remaining counts appear to have been misplaced. Infact, only results of 3 monsoon counts (of the 6 that should have been available by now), could be located, making inferences about the temporal changes in the numbers of the birds, and inferences about their seasonal presence, difficult. This mismatch in the numbers of the winter and monsoon counts (6 in winter, 3 in monsoons), must be considered throughout the following discussion.

### THE BIRDS OF THE DEER PARK.

During all the counts in this area, a total of 77 species have been sighted (see section B of Summary). Of these, the vast majority are land-birds; 64. Only 8 species of birds-of-prey, and 8 of water-birds were spotted. This is, of course, not surprising as there are very few water habitats in this area. Note should be taken of the fact that despite migrants, and the fewer monsoon counts, the numbers of species seen in the monsoons was slightly greater overall (60 verses 58). Taking the land and water-birds seperately, it is seen that more species were seen of the former in the monsoon (52 verses 48), while water-bird species were slightly commoner in the winters (8 verses 6).

Looking at the average numbers of land-bird species for each individual count, it is seen that in the monsoon the average number seen is 37 (range 27 to 42), while in winter the average is only 27 (range 17 to 29) ! This means that many of the species come to this area in the monsoon, and disperse elsewhere in the winters. In other words, birds with a monsoon predominance are more plentiful, than those with a winter predominance. We will return to this point later, and see whether this conclusion stands up to further analysis.

### THE NUMBERS OF BIRDS AT THE DEER PARK.

What of the numbers of birds seen in the counts ? Referring to section C of the analysis, it is seen that just as the overall numbers of species was nearly equal in the two seasons, so also the numbers of birds is also similar, with a slightly greater number being seen in the monsoon (1214 verses 1037). Yet when looking at the average number seen per count, there is a startling difference, with 404 being the average in



the monsoon, and 173 in winter ! Clearly, birds are much more concentrated here in the monsoon.

However, water-birds, unlike the land-birds, are commoner in the winters (172 birds of 8 species, verses 39 of 6 species). This difference is largely due to the Red Wattled Lapwing (101 seen in winter, 20 in monsoon). The fewer monsoon counts could have also biased the result.

As to the numbers of the individual species seen of note is the fact that the most numerous birds are those of the garden habitat, and ones commensal with man (habitats C15 & C18) (section D of Summary). Infact, of the 8 most numerous birds, the Jungle and Common Babbler, Rose Ringed Parakeet, Common Myna, House Crow, Red Wattled Lapwing, Blue Rock Pigeon and Red Vented Bulbul, only 2 (the Common Babbler and Lapwing), belong to a different habitat. Of these 2, there is some doubt about the identification of the Common Babbler in the monsoon '87 count, where an unbelievable 83 were reportedly seen.

Comparing the numbers of birds seen here to other areas with predominantly land-bird species, it is seen that the Deer Park has relatively very few birds in comparison. Witness the fact that the average number of birds per count in Lodhi Gardens was 440, JNU was 685, and R.N.Ridge 300. Here, in the Deer Park, the average is the least - 250 birds/count ! This paucity of birds is probably a reflection of the immaturity of this area as a bird habitat, for at the present time it is no longer in its prestine state of wilderness, nor has it yet matured into an excellent garden habitat like Lodhi Gardens. This fact is further supported by the average numbers of birds seen here per hour of bird-watching - 69.2, compared to 163 for Lodhi Gardens, and 192 for R.N.Ridge. (This figure is unavailable for the JNU counts).

#### SEASONAL STATUS OF THE BIRDS OF THE DEER PARK.

Now let us examine the seasonal status of the birds of this area (section E of the Summary). Here it is seen that 34 species or 44% of the total show a monsoon predominance; ie. are at least 2ce as numerous in the monsoon as in the winter. 27 species (34%) show a winter predominance, and only 16 species or 21% are present in similar numbers in both seasons. Hence, we see that inspite of the many fewer monsoon counts, the monsoon predominant birds still outnumber the winter predominant ones, so supporting our conclusion made in the earlier section, 'The Birds of the Deer Park'.

Of the known winter migrants, there are 10 species, of which 2 were seen, paradoxically, in the monsoon counts; both were seen only once in monsoon '81. These were the Common Swallow and Pied Bushchat. None of the migrants were seen in large numbers, and the most numerous were the Blackwinged Stilt (which is also a local migrant), the Warblers (all), and the Redstart, in descending order of their numbers.

The birds that may be locally migrant to this area in the winter are the Red Wattled Lapwing, Rufous Backed Shrike, Blackwinged Stilt, and Indian Robin. However, the unequal number of winter and monsoon counts makes this determination difficult. The birds that may be monsoon migrants to the area, on the

contrary, can be identified with greater confidence. These are the Black Drongo, House Swift and Green Bee-eater, all of which are at least 5 times commoner in the monsoons, and were seen at least 3 times (in this case, in all the monsoon counts).

#### THE STATUS OF THE BIRDS OF THE DEER PARK.

What have the counts disclosed about the changes in numbers of the birds in this area over the years? At the outset, let us remember that the fewer monsoon counts, and the fact that the total number of counts is only 9, makes conclusions difficult. Hence, conclusions have been drawn only in relatively few cases. (See section F of Summary.)

It was seen that out of a total of 77 species, 4 could not be analysed due to doubts about the identification, or recording. These are the House Crow and Sparrow, Common Babbler and White-browed Bulbul. Another 38 species were seen too infrequently to draw any conclusions, and 7 were seen in fluctuating numbers, but with no definite change.

This left a group of 29 birds in which analysis was attempted. Of these species, 15 showed no change in numbers and included the Rose Ringed Parakeet, Peafowl, Ringed Dove, Treepie, Hoopoe etc. A whooping 9 species (more than any other area), showed a probable or definite increase in numbers. Of these, the ones belonging to the garden habitat, are the Magpie Robin, Fantail Flycatcher and the Goldenbacked Woodpecker; the Common Myna is commensal with man, and is also increasing; water-birds, the Black Winged Stilt and Common Sandpiper; and the Cattle Egret belonging to the B14 (open areas with interspersed trees and possible cultivation), are also on the increase. Clearly, birds of the garden habitat are finding this area congenial to their taste, and a few water-birds are also better able to eke out their existence here! The absence of birds of the ridge habitat in this group of flourishing birds is especially interesting, and doubtlessly reflects the fact that as the garden habitat becomes more firmly rooted, any remaining pockets of original ridge vegetation or wilderness are destroyed.

What of the 6 species that showed a definite, or probable, decrease? (See section F, Summary.) It is seen that 4 species showed a definite decrease in numbers. These are the Indian Robin, Warblers (all), Grey Partridge, and Baybacked Shrike. The remaining one, showing a possible decrease, is the Redstart.

In the next section of the Summary, (G), an extremely intriguing fact is noticed; that all the 4 species that are definitely decreasing, belong to the ridge habitat. Only the Redstart, a migrant, belongs to the garden habitat. Again it is noticed that water-birds and those belonging to the garden habitats are generally not threatened.

Looking at the nesting requirements of these birds, 2 are seen to be migrants (Redstart and Warblers, the latter in fact with varying breeding habits), and of the remaining three, the Indian Robin and Grey Partridge breed in dry wastelands (sites B7 & B8). The Baybacked Shrike builds its nest in low trees (site B10).



What of the dietary requirement of these threatened birds ? Notice, that 4 of the 5 consume diet 1 (insects); 3 of these eating only insects (Redstart, Indian Robin and Warblers), and the fourth eating the as the main part of its diet (Bay Backed Shrike). The remaining threatened bird (the Grey Partridge), takes grass seeds as its main diet, but also insects as its associated diet. However, the fact that all the threatened birds eat insects as a major part of their diet, may not be as significant as it appears at first, for when the diet of all the birds of this area is looked at, it is seen that of them too, (80%) consume insects only, or as a major part of their diet.

Finally, looking at the seasonal prevalence of the threatened species, we see that 2 are known winter migrants (Redstart and White Wagtail), 1 shows a marked winter predominance (the Indian Robin), and two a monsoon predominance (Baybacked Shrike and Grey Partridge). Hence, none of the threatened species is equally present in both seasons.

# DEER PARK : SUMMARY OF BIRD COUNT ANALYSIS

A) COUNT DATA :	Winter	Monsoon	Total
Number of Counts done/results available :	6	3	9
Total hours taken during counts :	21.2	11.3	32.5
Average time per count (hours):	3.5	3.8	3.6✓

B) THE BIRDS	Winter	Monsoon	Wn/Mo	Overall
Species of land birds seen :	48	52	0.9	64
Species of water birds seen:	8	6	0.8	8
Species of birds-of-prey seen:	2 ✓	2✓	1.0	3
Number of species seen overall :	58	60	1.0	77
Average number of species / count	27	37	0.7	31

Significant species for which area is of primary importance :

- |                          |                           |                    |
|--------------------------|---------------------------|--------------------|
| 1. Large Cuckoo Shrike . | 3. Grey Headed Flycatcher | 5. Red Turtle Dove |
| 2. R'Breasted Flycatcher | 4. Fantail Flycatcher     | 6. Treepie         |

C) THE NUMBERS OF BIRDS.	Winter	Monsoon	Wn/Mo	Total
Number of land birds seen :	841	1151	0.7	1991
Number of birds-of -prey seen :	24	24	1.0	48
Number of water-birds seen :	172	39	4.4	211
Total of ALL birds seen :	1037	1214	0.9	2249
Average number of birds/count:	173	404	0.4	250
Birds sighted / hour of counting :	49	107	0.5	69.2

## D) NUMBERS OF THE INDIVIDUAL SPECIES

5 most numerous species ( in winter, monsoon & overall) :

Winter	Monsoon	Overall
1 R'Wattled Lapwing	Common Myna	Jungle Babbler
2 Rose R'Parakeet	House Crow	Rose Ringed Parakeet
3 Jungle Babbler	Jungle Babbler	Common Myna
4 Common Myna	Common Babbler	House Crow
5 Redvented Bulbul	RoseRing Parakeet	Common Babbler

## E) SEASONAL STATUS OF THE BIRDS

Species predominant in winter (including migrants) : 27

the monsoon : 34

Species seen equally in both seasons : 16

Number of species of known winter migrants : 10

Five most numerous known winter migrants :

- |                    |                          |             |
|--------------------|--------------------------|-------------|
| 1. Warblers (all)* | 3. Common Swallow        | 5. Redstart |
| 2. Pied Bushchat*  | 4. R'Breasted Flycatcher |             |

\* Some species of #1, and one race of #2 are residents in Delhi.

Number of species locally migrant in winter : 4

Names of species :

- |                      |                      |
|----------------------|----------------------|
| 1. R'Wattled Lapwing | 4. Jack Winged Stilt |
| 2. Rfs'Backed Shrike | 5. Indian Robin      |



AREA DEER PARK (contd.)

SECTION G (contd.)

Number of species of defined monsoon migrants : 3

Names of species :

1.Green Bee eater                      2.Black Drongo                      3.House Swift

F) STATUS OF THE BIRDS

Species with inaccurate counts : 4

Species sighted too infrequently for analysis : 37

Species seen with varying numbers : 7

Species with no change in numbers : 15

Species with probable decrease in numbers : 1

Names of these species :

1.Redstart

Species with definite decrease in numbers : 4

Names of these species :

1.Warblers (all)                      3.Indian Robin  
2.Grey Partridge                      4.Bay Backed Shrike

Species with probable increase in numbers : 6

Names of these species :

1.Blue Rock Pigeon                      3.Magpie Robin ✓                      5.Fantailed Flycatcher  
2.Black Winged Stilt                      4.Cattle Egret                      6.Common Sandpiper

Species with definite increase in numbers : 3

Names of these species :

1.Common Myna.                      2.House Swift                      3.Golden Backed Woodpecker

G) ANALYSIS OF THREATENED BIRDS

	Water	Land	Man-made
Habitat preference :	0	4	1 (Redstart)
(Numbers of birds)			

	0	3	0
Nesting sites preferred:			
(Numbers of birds)	#2 species are winter migrants		

	Animal origin	Vegetable
Diet consumed :	4 (insects)	1 (grass seeds)
(Numbers of birds)		

Seasonal Status (Numbers of Birds) :

	Winter	Equal	Monsoon
	Predominant Migrant		Predominant Migrant
	1                      2	0	0                      2

## ANALYSIS OF THE BIRD COUNTS AT J.N.U.

### INTRODUCTION.

The Jawaharlal Nehru University campus in South Delhi consists, in part, of a vast expanse of wilderness. This unbuilt area, together with the terrain extending southwards towards Mehrauli, probably represents the original wilderness of the Aravalli ranges more closely than any other remaining region in Delhi. Unlike the Delhi Ridge which was extensively planted with exotic species of trees in the past, this area in South Delhi has been mercifully 'neglected'. Hence, though the topography resembles the Delhi Ridge in several respects, it boasts of a rather different vegetation. In addition, it has fewer trees, is less arid, and has several ponds, one of which is perineal. Because of the greater amount of available water, water-birds are more frequently seen here. Another unique feature of the area is the so-called 'Grand Canyon'; a deep trench probably partly natural, and partly dug out by humans many years ago, in order to mine badarpur. Here are known to reside Great Horned Owls, a rare bird in Delhi by any standards. Besides this, there is an area with a grove of trees, the nursery of JNU, where birds preferring dense tree cover, are found.

The bird-counts were begun here in Jan. 1981, and initially continued with great regularity till monsoon of 1984. At this point, they were stopped cold turkey, only to be begun again in monsoon 87, after a break of two and a half years. But even in the 9 counts conducted, the wealth of bird-life in this area is very apparent, and inclusion of the area regularly in future counts, must be considered seriously.

### THE BIRDS OF JNU.

During the 9 counts mentioned above, 87 species of birds (65 land-birds, 12 birds-of-prey, and 10 water-birds), were seen (See section B of Summary). Of these, sightings of the Striated Babbler, Black Partridge and White Cheeked Bulbul are by far the most numerous compared to anywhere else in Delhi; while the sighting of 12 birds of-prey, including the White Eyed Buzzard, Tawny Eagle, Black Winged Kite, Barn, and Great Horned Owls, along with the commoner Spotted Owlet, is nothing less than spectacular for an area so close to the metropolis of Delhi.

Another unique feature regarding the birds of this area, is that due to a heavily wooded area, albeit a small one, a number of garden birds are also seen in surprisingly large numbers here. Witness, for example, the sightings of Ioras, White Eyes, Hornbills, Coppersmiths, Green Pigeons, Indian Hawk Cuckoos, and Koels. It is the combination of all these different types of habitat that allow widely differing bird species to exist in close proximity, so giving this area its unique flavour.

Looking now at the numbers of species per count, it is seen that an average of 39 species were seen in the 4 winter counts (range 42 to 32 species per count), and an average of 42 (range 52 to 27) in the 5 monsoon counts. Overall too, the numbers of species seen in winter was slightly less; 70 verses 76



in the monsoon. Hence, once again, it is seen that in this area too, more species are seen in the monsoon, notwithstanding winter migrants. This fact is also noticed in all the other areas with primarily land-habitats, where analysis was attempted.

#### THE NUMBERS OF BIRDS OF JNU.

On scrutinising the numbers of birds seen in the JNU counts, ( see section C of Summary) , we see that the total number of birds seen in this area is much greater than in any of the other land-based areas. 6167 ( average 685 birds/count) were seen here, compared to an average of 440/count in Lodhi Gardens, 300 in the Rajendra Nagar Ridge, and 250 in Deer Park. However, if the numbers of birds seen per hour of bird-counting in each area is looked at, (which is clearly a more accurate measure of their density in the area), then the values are as follows: Lodhi Gardens, 163 birds/hour of counting, JNU, 150, RNRidge 92, and Deer Park 69 birds/hour. It is interesting, therefore, to note that a mature garden habitat harbours the most birds, while a fairly well-watered tract of the original wilderness of Delhi almost matches that number. Brought into sharp focus, is the extremely few birds that an immature garden habitat (Deer Park), can sustain (Numbers for JNU approximate only).

Getting back to JNU's birds: Section C of the Summary also shows that the numbers of birds is also much greater in the monsoons; 3826 verses 2363. Even taking into account the one less winter count, the difference is still considerable.

Turning our attention to the individual bird species, (section D of Summary), it is seen that the Redvented Bulbul, Rosy Pastor, Common Myna, and Indian Robin, are among the 5 most numerous birds. Among these, special mention must be made of the Indian Robin; a bird that is decreasing in most areas of Delhi, and yet is so numerous in this area that an average of 37 were seen per count here. This area is surely one of the last remaining strong-holds of this bird in Delhi ! The House Sparrow, the 2nd most numerous recorded, is not a true inhabitant of this terrain; it is mostly recorded when the count route passes through human settlements in the area. Besides these, note must be made of the White Cheeked Bulbul, 157 of which were seen in these counts; barely a dozen were seen in the rest of Delhi in the same period ! The large numbers of the Black Partridge and Black Winged kite are noteworthy. Finally, 12 Great Horned Owls recorded are almost certainly the same 2 or 3 birds seen repeatedly each year, for they are always seen in the 'canyon', and the species is known to be long lived.

What of the seasonal status of the birds of JNU ? Section E of the Summary summarises this. It is seen that fully 48 birds show a monsoon predominance (ie. are 2ce as common in the monsoon as in the winter), while in only 13 birds is the reverse true. The remaining, 27 birds (31% of the total species), are present in similar numbers in the 2 seasons. Interestingly, this is the largest percentage of birds staying in similar numbers throughout the year in any of the areas studied, and is probably a reflection of the availability of food and shelter year round.

Of all the birds seen here, 10 are known winter migrants. None of these are numerous, other than the Rosy Pastor and Starling, both of which were seen sporadically in large flocks, but, paradoxically, in the monsoon counts each time ! Besides the known migrants, only the Grey Shrike was seen frequently enough and in sufficient numbers, to classify it as being locally migrant to this area in winter.

Among the birds that show a monsoon predominance, there are a few that are so much commoner in the monsoon, that they may be called monsoon migrants to the area (we will define this as meaning that the species is seen solely, or atleast 5 times more frequently in the monsoon, and sightings are sufficient to arrive at a valid conclusion). These birds are the Grey Hornbill, Black Partridge, Bay Backed and Rufous Backed Shrikes, Ashy Wren-warbler, Baya Weaver-bird, and the Pied Crested Cuckoo. Some of the birds fulfilling the above criteria, but being seen in unusually large numbers in one count, have been omitted from this group, till further counts can reveal their true standing in this regard.

Finally, it should be noted that all the water-birds that are not winter migrants, are seen more frequently in the monsoons. This is, of course, not surprising.

#### ADDENDUM.

(No attempt has been made to define the trends shown by the bird species over the years of the counts, as the gap of two and a half years between now and when the counts were being conducted regularly in this area is too great to allow any valid conclusions applicable today.)



# J.N.U. : SUMMARY OF BIRD COUNT ANALYSIS

A) COUNT DATA :	Winter	Monsoon	Total
Number of Counts done/results available :	4	5	9
Total hours taken during counts :	inaccurate data		
Average time per count (hours):	inaccurate data		

B) THE BIRDS	Winter	Monsoon	Wn/Mo	Overall
Species of land birds seen :	53	59	0.9	65
Species of water birds seen:	7	8	0.9	10
Species of birds-of-prey seen:	10	9	1.1	12
Number of species seen overall :	70	76	0.9	87
Average number of species / count	39	42	0.9	41

Significant species for which area is of primary importance :

- |                         |                      |                   |
|-------------------------|----------------------|-------------------|
| 1. Striated Babbler     | 4. Black Partridge   | 7. W'Eyed Buzzard |
| 2. White Cheeked Bulbul | 5. Black Winged Kite |                   |
| 3. Pied Crested Cuckoo  | 6. Great Horned Owl  |                   |

C) THE NUMBERS OF BIRDS.	Winter	Monsoon	Ratio	Total
Number of land birds seen :	2128	3776	0.6	5904
Number of birds-of -prey seen :	167	95	1.8	262
Number of water-birds seen :	68	65	1.0	123
Total of ALL birds seen :	2363	3826	0.6	6167
Average number of birds/count:	591	765	0.8	685

Birds sighted / hour of counting : Inaccurate data #  
 #Number of hours taken for counts not available.

## D) NUMBERS OF THE INDIVIDUAL SPECIES

5 most numerous species ( in winter, monsoon & overall) :

	Winter	Monsoon	Overall
1	House Sparrow	Rosy Pastor	Redvented Bulbul
2	Redented Bulbul	Redvented Bulbul	House Sparrow
3	Common Myna	Common Myna	Rosy Pastor
4	Indian Robin	House Sparrow	Common Myna
5	Scavenger Vulture	Indian Robin	Indian Robin

## E) SEASONAL STATUS OF THE BIRDS

Species predominant in winter (including migrants) : 13  
 the monsoon : 48  
 Species present in equally in both seasons : 26

Number of species of known winter migrants : 10

Names of five most numerous known winter migrants :

- |                |                   |                 |
|----------------|-------------------|-----------------|
| 1. Rosy Pastor | 3. Redstart       | 5. Grey Wagtail |
| 2. Starling    | 4. Yellow Wagtail |                 |

Number of species locally migrant in winter : 2

Names of species :

- |                |                          |
|----------------|--------------------------|
| 1. Grey Shrike | 2. Scavenger Vulture (?) |
|----------------|--------------------------|

Number of species of defined monsoon migrants : 7

Names of species :

- |                  |                         |                  |
|------------------|-------------------------|------------------|
| 1. Grey Hornbill | 4. Rufous Backed Shrike | 7. Ashy Wren (?) |
| 2. Black Partri  | 5. Baya Weaver          |                  |
| 3. Coppersmith   | 6. Pied Crested Cuckoo  |                  |

## ANALYSIS OF THE BIRD COUNTS AT KUSHAK NALA

Kushak Nala is one of the storm water drains of Delhi. What makes it different from other such drains, is, however, the fact that in the summers, only a small area, barely 3 feet in width, is submerged under water. The vast majority of its banks, during all but the monsoons, and always the bunds on either side, are not submerged. These banks, with their reed-beds, and surrounding tree plantations, provide suitable habitats for a diverse variety of bird-life, which is, further, rarely disturbed, except for the collection of fire-wood and self-relief by the numerous labourers of the surrounding area.

The area in question consists of about 1.7 km. of this Nala as it passes through South Delhi, and the surrounding green areas along its banks. The rich bird-life, and the central, easily accessible, situation of the area, prompted its inclusion in the bird-counts. Unfortunately, the counts were never done regularly here, and were stopped for the last 3 years altogether. With recent revival of interest in this area, the count was done again in monsoon 1987, and it is to be seen whether the counts will now be conducted here on a regular basis.

To date, only 6 counts (4 in winter, and 2 in the monsoon), have been held here. Due to the paucity of data, therefore, only a description of the bird species, and their relative numbers will be attempted. A minimal attempt to analyse the seasonal prevalence of the birds, and no attempt to determine temporal trends will be made.

### THE BIRDS OF KUSHAK NALA.

During the 6 counts mentioned above, a total of 82 species of birds have been sighted here (see section B of the Summary). Of these, there were 68 species of land birds, 4 birds-of-prey, and 10 species of water birds. It is of interest to note that this is the only area in which counts have been done, where the 3 species of Bulbuls (Redvented, Red Whiskered, and White Cheeked), were seen in this (monsoon '87) count. As this had never been seen here before, it may be due to the Bulbuls of the adjacent colonies taking refuge here as the surroundings become built up. Also interesting is the sighting of Red Munias, Grey Partridges, and Indian Rollers, all birds that are rather unlikely denizens of an area situated in the heart of Delhi. Of even greater relevance, is the frequent sighting of Black Winged Kites, and of the Yellow Wattled Lapwings, both birds rare everywhere in Delhi.

As regards the number of species seen in the two seasons, it is seen that a total of 72 species were sighted in winter, compared to only 50 in the monsoon. This difference would appear to be significant, but the fewer monsoon counts, and the unusually small number of species seen in the monsoon '83 count (24), may have led to an erroneous figure. Further count results must be awaited till a definite statement can be made.



## THE NUMBERS OF BIRDS OF KUSHAK NALA.

Looking at the numbers of birds sighted during the counts, it is seen that the most numerous are the House Crow, and Common Myna followed by the Pied Myna, Common Babbler, Redvented Bulbul, House Sparrow, and Red-wattled Lapwing. The large numbers of Brahmini Mynas, Bayas and Ashy Wren-warblers are heartening; (see section D of Summary).

## SEASONAL STATUS OF THE BIRDS OF KUSHAK NALA.

Due to the different numbers of winter verses monsoon counts (winter 4 & monsoon 2), any attempt to determine seasonal prevalence is fraught with error. All that can be stated with safety is that of the known winter migrants, 10 have been sighted in this area. None are numerous, the most numerous being the Common Swallow of which 52 were seen, all the Warblers, (49 seen), and the Starling, of which 13 were seen. Other migrants, though often seen consistently, were seen in even smaller numbers.

# KUSHAK NALA : SUMMARY OF BIRD COUNT ANALYSIS

A) COUNT DATA :	Winter	Monsoon	Total
Number of Counts done/results available :	4	2	6
Total hours taken during counts :	10.7	6.3	17
Average time per count (hours):	2.7	3.2	2.8

B) THE BIRDS	Winter	Monsoon	Wn/Mo	Overall
Species of land birds seen :	59	42	*	68
Species of water birds seen:	9	6	*	10
Species of birds-of-prey seen:	4	2	*	4
Number of species seen overall :	72	50	*	82
Average number of species / count	48	33	1.5	48

Significant species for which area is of primary importance :  
 1. Black Winged Kite      2. Yellow Wattled Lapwing

C) THE NUMBERS OF BIRDS.	Winter	Monsoon	Wn/Mo	Total
Number of land birds seen :	1604	911	*	2515
Number of birds-of -prey seen :	146	23	*	169
Number of water-birds seen :	165	60	*	225
Total number of birds seen :	1915	994	*	2909

\*Due to unequal numbers of winter and monsoon counts,  
 Wn/Mo ratio would be misleading and hence is not given.

	Winter	Monsoon	Wn/Mo	Overall
Average number of birds/count:	479	497	1.0	485
Birds seen /hour of counting :	179	158	1.1	171

## D) NUMBERS OF THE INDIVIDUAL SPECIES

5 most numerous species ( in winter, monsoon & overall) :

Winter	Monsoon	Overall
1 House Crow	Common Myna	House Crow
2 Common Babbler	Redvented Bulbul	Common Myna
3 Common Myna	Pied Myna	Pied Myna
4 L' Brown Dove	House sparrow	Common Babbler
5 R' Wattled Lapwing	House Crow	Redvented Bulbul

## E) SEASONAL STATUS OF THE BIRDS

Number of species predominant in the winter : \*

the monsoon : \*

Number of species of known winter migrants : 10

Names of the 5 most numerous known winter migrants :

1. Pied bushchat      3. Warblers (All)      5. Common sandpiper  
 2. Common swallow      4. Starling

\*One race of #1, and some species of #3 are resident in Delhi.

Number of species locally migrant in winter : \*

Number of species of defined monsoon migrants : \*

\*Due to unequal numbers of winter and monsoon counts,  
 inferences dependant on the relative numbers of winter  
 and monsoon counts would be misleading, and so not computed.



## ANALYSIS OF THE RAJENDRA NAGAR RIDGE BIRD COUNT.

### INTRODUCTION.

The inclusion of the Delhi Ridge in any bird-watching exercise needs no explanation. The area is different from all the other habitat areas in Delhi, and harbours a vast variety of bird-life with several species being rarely seen elsewhere. It is a vast expanse of wilderness, still miraculously untouched by man in most areas in dire need of study and documentation, to support measures to prevent its destruction by the land-hungry DDA and other private organisations. And yet, of all areas, it is this that has been most neglected by the Kalpavriksh bird-count enthusiasts.

After a promising start in 1981, when three different areas of this region were taken up for the counts, interest sagged, and the counts were discontinued in two of the three areas in 1984. The Old Delhi Ridge count was continued uninterrupted, but voe be it, that all the count results of this area till January 1987 were misplaced, and are unavailable for analysis. So too, were the results of the New Delhi Ridge area, in the region of Wellington Crescent. Only the results of the Rajendra Nagar Ridge remain, and of these too, there are voefully few, numbering a total of 5 done between monsoon 1981 and winter 1984, and a 6th of monsoon 1987.

Starting with this count (monsoon '87), the counts of the Ridge are being revived in three areas; Old Delhi, near the University; Rajendra Nagar; and New Delhi Ridge, the latter count having been entrusted to the Army Public School, who have an active bird-watching group. Let us hope that future counts in this area will be more successful than the past ones have been.

Based on the small data-base available, a partial analysis of the R.N.Ridge counts will now be attempted.

### THE BIRDS OF RAJENDRA NAGAR RIDGE.

In the 6 counts done in this area till now, 75 species of birds have been identified (see section B of the Summary). Of these, 64 were land-birds, 6 birds-of-prey, and 5 water-birds. Of the latter, all were seen less than twice in all the counts, and in numbers of 6 or less overall. This is the poorest record of water-birds among all the areas, emphasising the dryness of this area. However, its importance as a habitat for birds-of-prey is seen even in these few counts; witness the sighting of Kestrel, Shikra, Blackwinged Kites and the King Vulture. None of these, have been sited in any other area during the Delhi bird-counts.

Of the land-birds, the Sirkeer Cuckoo, Chestnut-bellied Nuthatch and Red-winged Bushlark, have not been seen elsewhere. It is also one of the few areas where the Red Turtle Dove, Scarlet Minivet, Brown Rock Chat, and Blue Rock Thrush, have been seen.

As to the numbers of species seen in the 2 seasons, an average of 39 were seen in the 4 monsoon counts, and an average of 35 in each of the 2 winter counts. The average numbers of birds, on the other hand, was 319 in the monsoons, and 263, in

the winters (see section C of the Summary). As the numbers of birds, and the number of species are proportionate, (ie. on an average 8 birds / species were seen in the monsoon, verses 7.5 birds / species in the winter), it can be inferred that an equal number of bird species show monsoon and winter predominance, in addition to those found in similar numbers in both seasons.

#### THE NUMBERS OF BIRDS OF R.N.RIDGE.

Information pertaining to the numbers of birds seen in the RNRidge is summarised in section D of the Summary. Just as in other primarily land-habitat areas, the maximum number of any species is not anywhere close to the numbers seen in mixed land & water habitat areas. The most numerous recorded, the White Backed Vulture, is, however, difficult to count accurately. The next 4 most numerous are the Redvented Bulbul, House Crow, Warblers (all), and the Large Gray Babbler. Note also that of the 10 most numerous species, 6 belong to the ridge habitats (B11 to B14), 3 to the garden habitat (C15), and only one is commensal with man; the House Crow.

#### SEASONAL STATUS OF THE BIRDS OF R.N.RIDGE.

Section E deals with the the seasonal prevalence of the birds in this area. Unfortunately, due to the greater numbers of monsoon counts (4 verses 2 in winter), no real comments can be made about the true seasonal presence of the birds, except to say that there were only 7 recorded migrants to this area in these 6 counts. This paucity of migrants, may, in part, be due to the lumping together of all the Warblers, as individual identification of the members of this group of birds is unreliable by any but the most experienced bird-watchers. No other comments about the seasonal presence of the birds will be made till the data-base can be expanded with additional counts.



# RAJENDRA NAGAR RIDGE : SUMMARY OF BIRD COUNT ANALYSIS

A) COUNT DATA :	Winter	Monsoon	Total
Number of Counts done/results available :	2	4	6
Total hours taken during counts :	7.8	11.8	19.6
Average time per count (hours):	3.9	3.0	3.3

B) THE BIRDS	Winter	Monsoon	Wn/Mo	Overall
Species of land birds seen :	44	56	*	64
Species of water birds seen:	2	4	*	5
Species of birds-of-prey seen:	4	5	*	6
Number of species seen overall :	50	65	*	75
Average number of species / count	35	39	*	38

Significant species for which area is of primary importance :

1. Grey Partridge	4. Kestrel	7. Chestnut Bellied Nutach
2. R' Turtle Dove	5. Shikra	8. Scarlet Minivet
3. Mahratta Woodpecker	6. Sirkeer Cuckoo	9. Blue Rock Thrush

C) THE NUMBERS OF BIRDS.	Winter	Monsoon	Ratio	Total
Number of land birds seen :	420	938	*	1358
Number of birds-of -prey seen :	103	324	*	427
Number of water-birds seen :	6	14	*	5
Total of ALL birds seen :	529	1276	*	1802
Average number of birds/count:	263	319	*	300
Birds sighted / hour of counting :	68	108	*	92

## D) NUMBERS OF THE INDIVIDUAL SPECIES

5 most numerous species (in winter, monsoon & overall) :

Winter	Monsoon	Overall
1 W'Backed Vulture	W'Backed Vulture	W'Backed Vulture
2 Redvented Bulbul	Redvented Bulbul	Redvented Bulbul
3 Warblers (All)	House Crow	House Crow
4 Indian Robin	L'Grey Babbler	Warblers (All)
5 RoseRing Parakeet	Pariah Kite	L'Grey Babbler

## E) SEASONAL STATUS OF THE BIRDS

Number of species predominant in the winter : \*

the monsoon : \*

Number of species of known winter migrants : 7

Five most numerous known winter migrants

1. Warblers (All)	3. Redstart	5. Starling
2. Pied Bushchat	4. Kestrel	

\*One race of #2 and some species of #1 are residents in Delhi.

Number of species locally migrant in winter : \*

Number of species of defined monsoon migrants : \*

\* Cannot be determined because of unequal numbers of winter and monsoon counts.

## ANALYSIS OF THE JAHANPANA BIRD COUNT

Jahanpana, one of the so called 'City Forests' of Delhi, is largely a man-made habitat, in some ways similar to the Deer Park. It consists in some areas of artificially planted trees and other areas where the original vegetation and topography of the area has been retained. Even in this section there is progressive evidence of alterations caused by the inhabitants living in nearby areas, and the recent construction of a road bisecting the region; along with this, the construction of buildings at its periphery, is causing an ever increasing disturbance of the natural environment of the area.

The counts in this area were started in the winter of '82, but, unfortunately most of the original count data has been misplaced. What is available is in the form of a consolidated list with information on five counts from winter '82 to winter '84 and the only other result available is that of the present (Mon '87) count. Thus, the data is insufficient for attempting a complete analysis of the birds of this area. What little information can be gleaned from the available data shall be included in this summary.

During the six counts mentioned, a total of 49 species of birds (44 land birds, 2 birds of prey, and 3 water birds), were spotted (Section B of the Summary). This is the lowest number of species recorded from any area in Delhi. A possible reason is that, as in the case of the Deer Park, the initial habitat of this area was destroyed so as to create the area that exists today. This, largely garden habitat, has probably not yet matured and consequently has not been able to attract the numbers of birds and different species that a mature garden habitat, such as the Lodhi Gardens, has been able to do. A total of 1447 birds have been seen in the six counts to date, with 768 in the three winter counts and an almost equal number (712) seen in the monsoons (section C of Summary).

The Common Myna is easily the most common bird, with the Redvented Bulbul, Indian Robin, Peafowl, Common Babbler and the Rose Ringed Parakeet also seen in large numbers. All the Mynas (Bank, Brahminy, Pied and Common), are present, as also the three Babbler species (Common, Jungle, and large Grey). Among the birds of prey, the Pariah Kite and the White Backed Vulture, are the only ones to have been seen, the former consistently while the latter only once. Among the water birds, the Red Wattled Lapwing has been seen regularly, while the Little Green Bee Eater and the Cattle egret once each.

What of the seasonal status of the birds seen here? (see section E of the Summary). 18 birds have a Wn/Mo ratio of .5 or less. Yet the sightings are either too few, or the numbers recorded appear inconsistent and cannot be commented upon further. Among the known monsoon migrants, the Pied Crested Cuckoo, Koel, and the Indian Hawk Cuckoo, each has been seen only once in the six counts, and each time in the monsoons. 17 birds have been sighted which fulfill the criterion of winter predominant birds, or migrants, with a Wn/Mo ratio of 2 or more. Here again, the majority of the sightings are either too few, or the numbers recorded appear inconsistent. The Redstart, a known



winter migrant has been seen consistently, in all the winter counts, and is the most numerous winter migrant after the warblers (All). The Common Babbler appears to be winter predominant; however the identification of the babblers has been inaccurate too often to make a definite statement about the seasonal status of this bird.

No further analysis is attempted due to the paucity of data.

## JAHANPANA : SUMMARY OF BIRD COUNT ANALYSIS

ACCOUNT DATA :

COUNT DATA :	Winter	Monsoon	Total
Number of Counts done/results available :	3	3	6
Total hours taken during counts :	Inaccurate Data		
Average time per count (hours):	Inaccurate Data		

## BY THE BIRDS

THE BIRDS	Winter	Monsoon	Wn/Mo	Overall
Species of land birds seen :	35	36	1.0	44
Species of water birds seen:	3	2	1.5	3
Species of birds-of-prey seen:	2	1	2.0	2
Number of species seen overall :	40	39	1.0	49
Average number of species / count	27	28	1.0	28

Significant species for which area is of primary importance :  
1.Red Whiskered Bulbul      2.White Cheeked Bulbul      3.Peafowl

## C) THE NUMBERS OF BIRDS.

THE NUMBERS OF BIRDS.	Winter	Monsoon	Wn/Mo	Total
Number of land birds seen :	737	681	1.1	1385
Number of birds-of -prey seen :	25	17	1.5	42
Number of water-birds seen :	6	14	0.4	20
Total of ALL birds seen :	768	712	1.1	1447
Average number of birds/count:	256	237	1.0	482

Birds sighted / hour. of counting : Inaccurate Data

### DO NUMBERS OF THE INDIVIDUAL SPECIES

5 most numerous species ( in winter, monsoon & overall ) :

	Winter	Monsoon	Overall
1	Indian Robin	Common Myna	Common Myna
2	Common Babbler	Redvented Bulbul	Indian Robin
3	Common Myna	House Crow	Redvented Bulbul
4	Peafowl	RoseRing Parakeet	Peafowl
5	Warblers (all)	Indian Robin	Common Babbler

### F) SEASONAL STATUS OF THE BIRDS

Species predominant in winter (including migrants) :	17
the monsoon :	18
Species seen equally in both seasons :	14

Number of species of known winter migrants : 5

Five most numerous known winter migrants

1. Warblers (all) #      3. Grey Wagtail      5. Redstart ✓  
2. Common Swallow      4. Wagtail (unidentified)

#Some Warblers are known to be resident in Delhi.

Number of species locally migrant in winter : 8

Number of species of defined monsoon migrants : \*

\* Due to an insufficient number of counts, no attempt at determining the temporal trends has been made.



SECTION D

Comparison of the Various Areas.

## COMPARISON OF THE VARIOUS AREAS WHERE COUNTS WERE HELD.

In this section of the analysis, the various areas in which counts were held have been compared amongst themselves, in order to provide an indication of their individual merits as bird habitats, and thereby their relative importance. In total, nine areas are compared. The comparison of the areas will be done under 10 headings, in a way similar to the information tabulated in Table 9.

### 1. Number of counts.

The number of counts in each area is largely responsible for the statistical validity of the interpretation of the data, with a larger number of counts making the results more truly representative of the actual state of affairs in the area.

It is seen here that the only complete record is that of the ISBT/Jamuna area, with all the records since the inception of the counts in that area (winter 1982), available. In 4 other areas there have been no prolonged interruptions in holding the counts, and the number of results available are 9 or more. These are the areas (along with ISBT/Jamuna, of course), in which a complete analysis of the data has been attempted. These areas are Lodhi Gardens, Deer Park, Rajghat/Jamuna, and the Zoo. In the remaining areas, only a partial analysis has been performed (ie. in Jahanpana, Kushak Nala, Rajendra Nagar Ridge, and JNU). In all these latter areas, the counts had been interrupted for at least two-and-a-half years.

### 2. The time taken for the counts.

This information is available only for 7 of the 9 areas. It is not available for JNU and Jahanpana, as the amount of time taken was not consistently recorded by the counting team (JNU) or the actual count sheets were not available (Jahanpana).

In the remaining 7 areas, the average time for per count varied from a maximum of 4.1 hours for Rajghat, to a minimum of 2.8 hours for both ISBT and Kushak Nala. It should be remembered that the length of time taken for the count is representative of only the length of the count route, and the number and species of birds encountered, and not of the actual size of the region being surveyed.

### 3. Species of Birds seen.

The Rajghat/Jamuna area was by far the most productive in terms of the numbers of bird species seen, with 121 species having been seen here. The Zoo with 105 species, and ISBT/Jamuna with 98, come next. The obvious reason why these large numbers of species were seen in these 3 areas is because all three areas encompass both the water and land habitats within their boundaries. Interestingly, however, the Rajghat area holds the record for not only the maximum number of overall species seen, but also for the maximum numbers of land bird species, and water bird species individually, as well.

The maximum number of species seen in an area sporting mainly the land habitat, were seen in JNU (87 species). This area



is also remarkable, indeed unique, with regard to the numbers of species of birds of prey seen here (12). The area also holds the record for the maximum number of land birds seen in a mainly land habitat area: 65. The large number of species seen in Kushak Nala is, in part, related to the permanent nala that flows through its midst, and in that sense, it is not truly a primarily land habitat area.

As to the minimum number of species seen, Jahanpana leads in not only the least number of species seen overall (49), but also in the least number of land, water, and birds of prey seen individually, as well. In this regard, the relatively few species also seen in the other garden habitat areas (Deer Park, and Lodhi Garden), should be noted, as it is interesting that both areas of Delhi's largely original wilderness (JNU and RNRidge), support an equal, or greater number of land birds as do the garden habitats.

#### 4. Total number of birds seen:

Once again it is the areas with mixed water and land habitats that take pride of place as regards the numbers of individual birds seen, with the Zoo heading the list with a total of 12,863 birds, followed by ISBT where 9,290 birds were seen, and Rajghat with 7,768 birds seen. However, the larger number of birds seen overall in these areas is directly due to the number of water birds seen in each area, with the maximum number being seen in the Zoo, followed by ISBT and Rajghat. These water birds, as we saw in the analysis of the individual areas, consist, in large part, of the migrant water fowl.

If the numbers of land birds seen are considered separately, one finds that by far the largest numbers were seen in JNU, followed by the Zoo, Rajghat and Lodhi Gardens. The huge numbers of land birds seen in JNU once again highlights the importance of this area as a bird habitat. When the area with the least numbers of birds is looked at, once again it is seen that the least numbers were seen in Jahanpana, and then RNRidge. However, as only 6 counts were held in each of these 2 areas, this low number of birds spotted, cannot, by itself, be used to compare these numbers with the numbers seen in other areas.

Also seen is the fact that among all the areas manipulated by humans, it is the Zoo, with a mixed water and land habitat, that harbours the maximum birds; Lodhi Gardens, an almost pure garden habitat, harbours almost the same number of land birds, though understandably many fewer water birds; while, strikingly, the Deer Park and Jahanpana, both immature garden habitats, with varying amounts of 'semi-wilderness' thrown in, have by far the fewest birds, even after an allowance for the fewer counts in Jahanpana is made.

#### 5. Number of birds per hour.

Here, only 7 areas could be analysed due to incomplete data available for both JNU and Jahanpana. In the remaining areas, many of the same facts as were discussed above (section 4), are once again evident, and do not warrant repetition. Note, however, that the number of birds seen in the winter in the three mixed water/land areas (Zoo, ISBT, Rajghat), is much larger than

the numbers seen in the monsoons in the same areas. Once again this is due to the large numbers of migrant water fowl that come to these areas in the winters. On the other hand, in all the other areas (except Kushak Nala, which, as explained earlier, is not truly a primarily land habitat area), the numbers of birds seen per hour of counting is greater in the monsoons, than in the winter, stressing that land birds migrant to Delhi in winter are relatively very few, and that there appears to be a considerable influx of birds into Delhi in the monsoons.

#### 6. Winter monsoon ratio.

The facts discussed in sections 4 & 5 are again evident here. For example, the ratio of the numbers of birds seen in the winter to the numbers seen in the monsoon in the 3 mixed habitat areas range from 2.4 to 1.7. Also evident in these areas is the large ratio of water birds (winter verses monsoon), again stressing the larger numbers of water birds seen in these areas during the winter. As regards the land birds in the three areas mentioned, as well as the remaining areas where the ratio was computed (Deer Park, JNU, Lodhi Gardens), it is seen that the ratio is  $<1$ , i.e. more birds were seen in the monsoon than in the winter; a fact that has, of course, already been stated above.

#### 7. Seasonal status of the birds.

Of the 41 known winter migrants seen in the counts in total (not given in Table 9), the maximum number of species were seen in the Rajghat counts (32 species). The next largest numbers were seen in ISBT (24 species), and then the Zoo (23 species). In each of the other areas, no more than 11 species of known winter migrants were seen. Again, the larger number of known winter migrants seen in the three mixed habitat areas (Rajghat, ISBT, Zoo), is due to the larger number of migrant water-birds to visit these areas.

As to the birds that have been seen to be locally migrant in winter to each area, it is seen that in each of the 6 areas where an attempt was made to identify these birds, 2 to 4 species were noted. However, a larger number of monsoon migrants were seen, with the extremes of 3 in Deer Park and 11 in Rajghat, being identified. It is apparant, therefore, that as far as local migrants are concerned, Delhi is more important for the local monsoon migrants, than it is for the local winter migrants.

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[ The remaining part of this section deals only with 5 areas (Deer Park, ISBT, Lodhi Garden, Rajghat, and Zoo), as it is only in these areas that sufficient uninterrupted counts have been carried out to allow an attempt at determining the changes in status of the birds, as regards their numbers. The areas that are not dealt with here are JNU, Jahanpana, Kushak Nala, and Rajendra Nagar Ridge. These areas will not be mentioned again in this section. ]

#### 8. Species of birds that appear to be increasing.

Table 9 shows that there are relatively few species of



birds that have shown any indication of an apparent increase in their numbers. Overall, the Zoo and Rajghat each have 6 species that may be increasing. ISBT has the least number of species showing an apparent increase: 1; this may be a reflection of an increasing disturbance caused by humans in the area, as mentioned in the area summary of ISBT.

Most of the birds that appear to be increasing are land birds, with only the Zoo and Rajghat each having 3 species of water birds showing an increase. The remaining birds in these 2 areas, as well as the species that are increasing in the remaining areas are all land birds.

#### 9. The threatened birds.

The maximum number of threatened birds (i.e. those showing a possible, or definite decrease in their numbers over the count years), were seen in Rajghat (24 species), then the Zoo and ISBT (19 species each). The least number threatened are in the Deer Park (5 species). If the number of species decreasing is looked at as a percentage of the total number of species seen in the area, then an interesting fact emerges; all three mixed habitat areas have 18 to 20% of the total species seen in each individual area threatened. In the case of Lodhi Gardens, 17% of all the species seen here appear to be threatened, while in the Deer Park, this figure stands at only 7%.

However, when the number of species that are definitely threatened are looked at, it is seen that the Zoo leads the list, but once again by only a slight margin.

#### 10. Habitats, nesting, feeding habits, and seasonal status of the threatened birds.

(a) When the habitats of the threatened birds in each area are looked at, an interesting fact emerges: that in both the areas associated closely with the Jamuna (Rajghat and ISBT), over half of the threatened birds belong to the water habitat. In the Zoo, on the contrary, only 3 of the 19 threatened species belong to the water habitat. It appears, therefore, that the water habitats provided by the Jamuna have been adversely affected by factors that are not immediately obvious from the interpretation of this data, while the water habitats of the Zoo are relatively unaffected.

Also of interest is the fact that though only a few species appear to be decreasing in the Deer Park, 4 of the 5 that are threatened belong to the ridge habitats. This is not surprising as the vegetation and terrain of the ridge type habitats are among the first to go when a wilderness area is converted into a 'city forest'. Also of great interest (see area analysis of the Deer Park), is the fact that the birds increasing in this area, mostly belong to the man-made garden habitats; both these factors appear to show an evolution of species from those akin to ones seen in ridge habitats, to those seen in garden habitats. In Lodhi Gardens, a mature garden habitat, the threatened land bird species belong equally to the ridge and garden habitats.

(b) As regards the nesting sites preferred by the threatened

birds, the first notable feature is that only very few of them nest in sites related to humans. The majority breed in land related sites, and considerably fewer in water related sites. The land nesting birds are most affected in the Zoo, where 14 of the 19 threatened species nest in ridge/garden related sites.

(c) Looking at the diets preferred by this group of birds, it is clear that the majority consume insects. (This comes as no surprise, though, for, as stated in the general discussion on Delhi's birds, 74 species from among all the birds seen in Delhi, or 41% of total species, eat insects as their main diet). However, the decrease of the insect eating birds is espically marked in the Zoo, where 15 of the 19 species consume them as their main diet (80% of the threatened birds of the Zoo). Several species of the threatened birds also consume other animal based diets, and vegetarian diets, but in varying numbers in each area.

(d) Lastly, in reviewing the season status of these birds, it is seen that they have a widely varying status in three areas: ISBT, Lodhi Garden, and Rajghat. In the Zoo, on the contrary, the vast majority are equally present in the two seasons, while in the Deer Park, the threatened birds are either known winter migrants, or locally migrant to the area in winter or monsoon.



Table 9. A COMPARISON OF THE VARIOUS AREAS WHERE COUNTS WERE HELD.

Names of Areas	DEER PARK	ISBT/JAMUNI	JNU	JAHANPANA	KUSHAK NALA	LODHI GARDI	R'GHAT/JAM	RNRIDGE	ZOO
1.(a) Total # of Counts.	9	12	9	6	6	11	12	6	11
(b) # of Winter Counts	6	6	4	3	4	6	6	2	5
(c) # of Monsoon Counts	3	6	5	3	2	5	6	4	6
2.(a) Time for Counts (Hrs.)	32.5	33.7	Inc. Data	Inc. Data	17	29.7	48.5	19.6	32.6
(b) Avg. time/Count (Hrs.)	3.6	2.8	-Do-	-Do-	2.8	3.0	4.1	3.3	3
3.(a) Total species seen	77	98	87	49	82	77	121	75	105
(b) Land Bird Species Seen	64	58	65	44	68	61	74	64	70
(c) Water Bird Species Seen	8	37	10	3	10	10	41	5	31
(d) Birds of Prey Species	3	3	12	2	4	6	6	6	4
4.(a) Total # of Birds seen	2249	9290	6167	1447	2909	4843	7768	1802	12863
(b) # of Land Birds Seen	1991	3645	5904	1385	2515	4369	4867	1358	4994
(c) # of Water Birds Seen	211	5227	123	20	225	371	2540	20	7373
(d) # of Birds of Prey Seen	48	418	262	42	169	103	252	427	496
5.(a) # of Birds/Hour:Overall	69.2	276	Inc. Data	Inc. Data	171	163	171	92	395
# of Birds/Hour:Winter	49	355	-Do-	-Do-	179	129	202	67.8	498
# of Birds/Hour:Monsoon	107.4	178	-Do-	-Do-	158	206	126	108	291
6.(a) Wn/Mo Ratio:(Overall)	0.9	2.4	0.6	0.9	Not Comp.	0.8	1.7	Not Comp.	1.7
(b) Wn/Mo Ratio:Land Birds	0.7	0.7	0.6	1.1	-Do-	0.8	0.8	-Do-	1.2
(c) Wn/Mo Ratio:Water Birds	4.4	14.7	1.0	0.4	-Do-	0.9	1.7	-Do-	2.3
7.(a) # of Known Win.Migrants	10	24	10	5	10	11	32	7	23
(b) # of Local Win.Migrants	4	3	2	Not Comp.	Not Comp.	2	3	Not Comp.	4
(c) # of Monsoon Migrants	3	8	7	-Do-	-Do-	9	11	-Do-	6
8.(a) # of Species Increasing	3	1	Not Comp.	Not Comp.	Not Comp.	3	6	Not Comp.	6
(b) # Land Birds increasing	3	1	-Do-	-Do-	-Do-	3	3	-Do-	3
(c) # Water Birds increasing	0	0	-Do-	-Do-	-Do-	0	3	-Do-	3
9.(a) # of Threatened Species	5	19	Not Comp.	Not Comp.	Not Comp.	13	24	Not Comp.	19
(b) Definitely Threatened	1	7	-Do-	-Do-	-Do-	4	9	-Do-	10
(c) Probably Threatened	4	12	-Do-	-Do-	-Do-	9	15	-Do-	9
10. The Threatened Birds									
(a) Habitats									
(i) Water Habitat	0	13	Not Comp.	Not Comp.	Not Comp.	3	13	Not Comp.	3
(ii) Ridge Habitat	4	5	-Do-	-Do-	-Do-	5	7	-Do-	8
(iii) Garden Habitat	1	1	-Do-	-Do-	-Do-	5	4	-Do-	8
(b) Nesting									
(i) Water Related	0	6	Not Comp.	Not Comp.	Not Comp.	2	4	Not Comp.	1
(ii) Ridge Related	3	5	-Do-	-Do-	-Do-	6	11	-Do-	14
(iii) Human Related	0	1	-Do-	-Do-	-Do-	1	2	-Do-	2
(c) Diet (Main)									
(i) Insects	4	9	Not Comp.	Not Comp.	Not Comp.	8	11	Not Comp.	15
(ii) Other Animal Based	0	6	-Do-	-Do-	-Do-	1	3	-Do-	1
(iii) Vegetarian	1	4	-Do-	-Do-	-Do-	4	6	-Do-	3
(d) Seasonal Status									
Known Winter Migrant	2	7	Not Comp.	Not Comp.	Not Comp.	4	6	Not Comp.	5
Local Win. Migr/Predom.	1	1	-Do-	-Do-	-Do-	1	5	-Do-	1
Monsoon Migrant	2	4	-Do-	-Do-	-Do-	4	4	-Do-	0
Monsoon Predominant	0	2	-Do-	-Do-	-Do-	1	5	-Do-	1
Equally Present	0	5	-Do-	-Do-	-Do-	2	4	-Do-	12

Inc. Data ..... Incomplete Data in the available records.

Not Comp. .... Parameter not computed due to unavoidable bias in available data.

Migr ..... Migrant; Predom. .... Predominant.

SECTION E

Suggestions for the Preservation of Delhi's Birds



## SUGGESTIONS FOR THE PRESERVATION OF DELHI'S BIRDS

Based on the bird counts held in the 10 areas of Delhi over the preceeding 7 years, it would be prudent for us to make some suggestions for the safeguarding of Delhi's birds, and its environment at large. It will be readily appreciated that the following suggestions are based on an extensive data-base and its analysis, something which has never been attempted before in Delhi.

1. From the analysis of the data, areas that are exceptionally rich in bird-life have been identified. The following areas can thereby be stated to be of exceptional importance for the birds of Delhi, and therefore an attempt should be made to study these areas more thoroughly, and make viable plans for their conservation :

a) The Jamuna in the region where it passes parallel to Rajghat, and the intervening area of fields and wilderness. The varied habitats, and the large area covered by the region provides one of the richest bird habitat areas in Delhi. Here the maximum numbers of species of birds were spotted in the counts, and the maximum numbers of known winter migrants were sighted. The area is of exceptional importance as a habitat for the Marsh Harrier, Purple Heron, three types of Pochards, and several species of Wagtails, Swallows, and waders.

Nearly 20% of the species seen here have been shown to be decreasing over the 7 years during which the counts were held, a fact pointing towards stresses caused on the environment, and thereby the birds of the region. Conversion of this area into a 'river-front park', or its being appropriated for constructions will be extremely deleterious for the large variety of birds seen here, and measures to avoid this from happening need to be identified.

b) JNU : The wilderness areas of the Jawaharlal Nehru University Campus have proved to be the richest area for land birds unrelated to the water habitat, as regards their numbers and species. It is unique among all the areas in Delhi when one looks at the numbers of species of birds of prey sighted here - 12 species seen in 9 counts ! When one remembers that these include the constant sighting of a pair or more of Great Horned Owls in the so-called 'Canyon', the area acquires added importance. Infact, the Canyon itself is unique enough to warrant conservation in its own right as a geological wonder unlike any other in Delhi. But add to this the birds of prey mentioned earlier, the large numbers of White Cheeked Bulbuls, and Black Partridges, along with a huge number of birds that breed here during the monsoons in the midst of the original Aravilli vegetation, and you have an area distinct from any other in Delhi.

Yet, the destruction of this area is proceeding at a rapid rate, without so much as a whimper or tear from Delhi's inhabitants. Infact, part of the unique Canyon has already been destroyed in order to supply water for the DDA colony 'Vasant

Kunj', being built adjacent to it.

It is vital that urgent steps be taken in discussing the value of the area with the Delhi Administration, and the JNU authorities, so that steps can be taken to preserve at least parts of this area.

(c) The Delhi Ridge, known by all birding enthusiasts to be a haven for birds, has unfortunately, been woefully neglected in these counts. Even in the 6 counts that were held here, several rare birds were sighted, including the Sirkeer Cuckoo, Chestnut Bellied Nuthatch, Blue Rock Thrush and Kestrel. However, justice cannot be done to the area based on the few counts that were done here, and it is essential that the area be covered more fully in future counts by us, so that its wealth as a bird habitat can be more thoroughly documented.

(d) The region adjoining Kushak Nala in South Delhi is a patch of greenery, amongst the sea of buildings on the one side, and Safdarjang Airport on the other. A surprisingly large number of birds were seen in this area during the 6 counts conducted here, including the Yellow Wattled Lapwing and the Black Winged Kite. With minimal planning and expense, it should be possible to conserve this area, an aim towards which some members of 'Kalpavriksh' are already engaged.

Needless to say, the above areas are not the only ones that merit study, documentation and conservation; they are simply the ones that have been surveyed by the 'Kalpavriksh' enthusiasts, and hence strong data to support conservation plans for them can be produced readily. Similar exercises in several other areas in Delhi will doubtlessly allow identification of other important places in this region which would merit efforts at their conservation.

2. The analysis of the count data has indicated that destruction of a ridge-type habitat and conversion into a man-made 'city forest' leads to the progressive decrease in numbers of birds belonging to the ridge habitats, while birds belonging to the garden and other man-related habitats take hold in the region (see text of area Summary, Deer Park). Of the birds that are most severely affected during this conversion, are those depending on bushes and shrubs for their livelihood and breeding; those that benefit are birds such as Golden Orioles, that thrive in areas with a dense tree cover irrespective of undergrowth.

It is suggested that the mania for cutting all the bushes and shrubs during formation of the 'city forests' should be curbed; if they were left at frequent intervals, perhaps with some trimming to make them 'respectable' looking, then, at least 18 species of birds which would be otherwise doomed, will be able to eke out a living amidst them. Similarly, in established gardens, if the emphasis be changed from growing only majestic trees, to growing both trees and perennial shrubs and bushes, many more birds of the ridge habitats could survive in the surroundings. Although nearly any type of undergrowth will support more birdlife than none at all, so much the better if the landscapist could incorporate plants such as karil (*Coparis decidua*), the bush beri (*Ziziphus nummularia*), and other indigenous plants found in the Ridge, into the general scheme of



the garden layout. And this too without any significant losses of public interest.

(c) Just as bushes provide shelter and breeding sites to birds of the ridge habitats, so do rushes and reeds provide shelter for 11 species of water birds identified in the counts, and breeding sites for six species of birds that frequent areas near water. Encouraging such vegetation to grow wherever there is sufficient water, will help to encourage these birds to colonise the area. Sites that immediately come to mind are the Zoo, and Kushak Nala. Even in areas like Lodhi Gardens, these graceful water-plants, were they to be introduced intelligently into the ponds, will provide not only an extra dimension to the beauty of the garden, but also provide the added benefit of housing several bird species. Unfortunately, at the present time, any self-respecting mali will uproot any and all of these 'weeds' that he may find; but with proper education and understanding, this attitude can be changed.

4. It has been seen from the bird species identified during the counts, that fully 27 species breed in short trees, or in the lower branches of tall trees, while another 22 species breed high up on tall trees. Of all these 49 species of birds, only a couple (the House Crow and Pariah Kite) will nest in Eucalyptus trees; even other exotic trees like Gulmohar (*Poinciana regia*), Siris (*Albizia lebbek*), and Papar (*Pongamia glabra*), are not used by most birds for any purpose, be it feeding, shelter, or nesting. Hence, though these trees may grow rapidly, and charm the human eye, yet they go no further. On the other hand, trees such as Neem (*Azadirachta indica*), Simal (*Bombax malabaricum*), Pipal (*Ficus religiosa*), etc. are favoured for food, shelter and nesting by many birds, and other than the disadvantage of growing too slow in this fast-moving world, they are relatively harmless to human interests in most situations.

With the rapid destruction of many trees in and around Delhi, all that remain, and especially the latter ones named, could prove vital to the maintenance of the populations of several bird species. These trees must be preserved. In addition, whenever new trees are planted, the usefulness of the tree to birds and other small mammals needs to be considered on par with matters of cost and maintenance of the species of tree being planted. It is difficult, though, because the expenditure is so obvious, and the long term gain so hazy to most planners. But a concerted effort on the part of all those interested in the problem of afforestation on a large or small scale, could help to change the prevailing policies from those of immediate gain to those of long term benefits.

5. Another fact noted in the counts, were the relatively large number of species of water birds that appear to be decreasing in numbers in both areas of the Jamuna included in the counts. This decrease in water birds was not noted to be present in the Zoo, suggesting that the decrease in the several species of water birds in the ISBT/Jamuna and Rajghat/Jamuna areas was related to the water habitat of the Jamuna, rather than an overall decrease

in the numbers of the water birds in, or visiting, Delhi. The cause of the declining numbers is not immediately apparent from the count data, but it may well be related to pollution of the Jamuna water, and to increased human disturbance, the latter being of special significance in the ISBT area due to the construction of the trans-Jamuna bridge in that region. Whatever the cause, it needs to be investigated, and corrected, if possible.

6. Lastly, with the loss of so much of the natural habitat of the birds, some species may be encouraged to stay and breed in some areas by the provision of food and nesting boxes. The results of artificially provided food are already being seen in the National Zoo, where large flocks of wild water birds receive grain and fish in the winters to allow them to stay here for the whole season in rather cramped quarters. Plans to provide breeding boxes for wild Nakta Ducks are afoot, and should allow these tree-hole breeding birds to successfully breed in the Zoo. If the use of bird-baths, feeding tables and breeding boxes could be popularized among even a few of the human denizens of Delhi, many additional birds would find sustenance in the inhospitable, crowded, residential areas of this city.

7. An important fact to have emerged from the conduction and analysis of these bird counts is that such an exercise can indeed be conducted by a dedicated, although nonprofessional, group of individuals, and with sufficient dedication and expenditure of time, a useful set of data can be collected. This, in turn, can provide specific information on which recommendations for conservation of environmentally important areas can be based, and information about the habits and status of the birds of the area determined.

It is to be hoped that these counts will be continued in Delhi indefinitely, and that the experience gained here will be used by interested persons in other areas in our country to obtain similar information in their own regions. By pooling together information obtained by several groups carrying out simultaneous counts, much can be learned about the local movements and other habits of the birds, information that may not be available by any other means. In addition, documentation of important areas in each region where counts are done will allow a national effort to conserve this all too evident, yet largely neglected wealth of India - our birds.



## APPENDICIES

# APPENDIX 1

## KEY TO COLUMN 'HABITAT' (HAB)

[ In general, each species has been assigned a general habitat 'A' (water related), 'B' (ridge related), and 'C' (man related). This is followed by a number (1 to 18), which represents the specific habitat preferred by that species. In this section, a description of each specific habitat, along with an area or areas where it can be seen, is given.]

### GENERAL (G)

### SPECIFIC (S)

- |                      |  |
|----------------------|--|
| A) Water habitat :   | 1) Open expanses of water as seen in rivers or in large lakes (eg. in the Zoo, ISBT).<br>2) Water interspersed with reeds and rushes allowing birds to swim among them (eg. Zoo).<br>3) Open water with floating leaves (eg. Lilies); seen in ponds, rarely rivers.<br>4) Low vertical banks of river, stream or pond (eg. in the Jamuna, Zoo, K'Nala).<br>5) Shallow sloping shore as seen in parts of the Jamuna, and ponds.<br>6) Dense reeds & rushes on edge of water-body; water at most several inches deep (eg. Zoo).<br>7) Bushes or trees overhanging edge of water-body; (eg. in parts of the Zoo and Jamuna).<br>8) Dry sloping shore of sand/gravel; seen in Delhi mainly along the Jamuna.<br>9) Bushes and reeds adjoining waters edge, as seen in places along the Jamuna's banks.<br>10) Open areas in neighbourhood of water, as along the Jamuna (Rajghat area), and Zoo. |
| B) Ridge habitat :   | 11) Thorn scrub and grass jungle; driest of the ridge-related habitats.<br>12) Dry, rocky, with bushes and occasional trees; original ridge habitat, (eg. now seen in JNU).<br>13) Short trees with bushy undergrowth; (type of habitat largely seen in the Delhi Ridge area).<br>14) Open areas, possible cultivation, occasional trees; (eg. agricultural areas around Delhi).   |
| C) Man-made habitats | 15) Garden habitat with few trees and small plants; bushes are infrequent (eg. L'Gard.).<br>16) Garden habitat with groves of tall trees; (eg. in L'Garden and Zoo).<br>17) Monuments and old buildings; many of these are fairly isolated (eg. in L'Gard.).<br>18) Commensal with humans; these include birds that live among the dwellings of humans, or in the vicinity of garbage dumps etc.   |



## APPENDIX 1 (Contd.)

### KEY TO COLUMN 'NESTING' (NEST)

[ In general, each species has been assigned a preferred general (G) nesting site: 'A' being water related, and 'B' being land related. This is followed by the specific (S) site preferred; this can be any of the sites 1 to 12 given below. Note that along with a description of each specific site, is the name of a species that prefers it.]

#### GENERAL (G)

#### SPECIFIC (S)

- |                      |  |
|----------------------|--|
| A) Water related :   | 1) Floating nest on reeds and floating leaves<br>(eg. Pheasant tailed Jacana).<br>2) Reeds on waters edge; (eg. Coot).<br>3) Trees near water; (eg. Painted Stork).<br>4) Dry banks of rivers (eg. Spurwinged Plover).<br>5) Holes in river/tank banks (eg. Bank Myna).  |
| B) Dry land related: | 6) Open wasteland (eg. Red Wattled Lapwing).<br>7) Scrub country with stones and small bushes;<br>(eg. Indian Robin).<br>8) Tamrisk scrub with bushes (Grey Partridge).<br>9) Thorny bushes (eg. Common Babbler).<br>10) Low trees (eg. Redvented Bulbul).<br>11) Tall trees (eg. Grey Hornbill).<br>12) Man-made structures, eg. buildings, bridges<br>(eg. House sparrow). |

### KEY TO COLUMN DIET (DIET)

[ In general, each species has been assigned a main (M) and an associated (A) preferred diet. The former is what the species is known to eat primarily, the latter what it also consumes, but generally in lesser amounts. Other foods consumed by the species are not included for simplicity.]

( M = Main food consumed by species

A = Associated food consumed by species )

- |                   |   |
|-------------------|---|
| A) Animal origin: | 1) Insects, worms, grubs etc.<br>2) Molluscs & small water animals<br>3) Fish, frogs, crabs etc.<br>4) Small animals and birds<br>5) Carion |
| B) Plant origin : | 6) Water vegetation<br>7) Grass seeds<br>8) Grasses & shoots<br>9) Berries & figs<br>10) Flower nector                                      |
| C) Man related :  | 11) Fruit<br>12) Crops & seeds<br>13) Garbage   |

## APPENDIX 2

### ABBREVIATIONS USED IN THE TEXT & TABLES

#### A) Abbreviations for bird names used in Tables.

Alexand.	Alexandrian	:	Phes'Tail	Pheasant Tailed
B'	Black	:	Poch.	Pochard
Bl'	Blossom	:	P'	Purple
Crim.Bres	Crimson Breasted	:	R'	Red
C'nut	Chestnut	:	Rfs'	Rufous
Com.	Common	:	Sm.Ind.	Small Indian
G'	Golden	:	S'Bill	Stork Billed
IndHawk	Indian Hawk	:	W'	White
L'	Large	:	Yel'Eyed	Yellow Eyed
Lit.	Little	:	Y'	Yellow

#### B) Abbreviations used in Text

##### i) Abbreviations used for area names

ISBT	Inter State Bus Terminal
D'Park	Deer Park
J.N.U.	Jawaharlal Nehru University
L'Gard.	Lodhi Gardens
R'Ghat	Rajghat
RNRidge	Rajendra Nagar Ridge
Zoo	National Zoological Park

##### ii) Abbreviations used for Table headings

Mo., Mon.	Monsoon
Mon. #'s	Number seen in the monsoon counts
O'All	Overall Trend for the species
Ratio Wn/Mo	Number seen in winter counts divided by number seen in the monsoons counts
Trends	Change in numbers of each species over the years
Win. #'s	Numbers seen in the winter counts
Wn., Win.	Winter
Mo	Monsoon

##### iii) Abbreviations/symbols used in the tables

2 .....	Definite increase in numbers
1 .....	Probable increase in numbers
0 .....	No change in numbers
-1 .....	Probable decrease in numbers
-2 .....	Definite decrease in numbers
±0 .....	Varying numbers; no definite change
* .....	Sightings too few for analysis
? Acc.....	Accuracy of sighting questionable
Inacc.....	Deliberate undercounting of the species



# APPENDIX 3

## STATUS REPORT OF ALL SPECIES OF BIRDS IDENTIFIED IN DELHI BIRD-COUNTS

COMMON SPECIES Protection needed for species marked (*)	UNCOMMON SPECIES Need habitat protection	RARE AND SPORADIC Need total protection
*1 Babbler, Common	1 Babbler, Yel'eyed	1 Babbler, Striated
*2 Babbler, L'Grey	2 Barbet, L'Green	2 BeeEater, Bluetail
*3 Babbler, Jungle	3 BlueThroat	3 Bulbul, W'Browed
4 Barbet, Crim. Breast	4 Bulbul, R'Whisker	4 Plaintive Cuckoo
*5 BeeEater, Green	5 Bulbul, W'Cheek	5 Cuckoo, Sirkeer
6 Bulbul, Redvented	6 Bushchat, Collared	6 CuckooShrikeLarge
7 Crow, House	7 Bushchat, Pied	7 Dove, Spotted
8 Dove, Lit. Brown	8 Crow, Jungle	8 Flycatch, Greyhead
9 Dove, Ringed	9 Crowpheasant	9 Flycatch, Fantail
*10 Drongo, Black	10 Cuckoo, IndHawk	10 Hornbill, Grey
11 Hoopoe	11 Cuckoo, PiedCrest	11 Iora
*12 Lark, Others	12 Dove, R'Turtle	12 Lark, R'WingBush
*13 Martin, Sand	13 Flycatch, R'Breast	13 Minivet, Scarlet
*14 Munia, Red	14 Koel	14 Minivet, Small
*15 Munia, Spotted	15 Lark, Crested	15 Munia, W'Backed
*16 Munia, W'Throated	16 Munia, Blackheaded	16 Nightjar
17 Myna, Bank	17 Oriole, Golden	17 NuthatchC'nutBelly
18 Myna, Brahmini	18 Parakeet, Alexand.	18 Quail, Bush
19 Myna, Common	19 Parakeet, Bl'Head	19 RockChat, Brown
20 Myna, Pied	20 Partridge, Black	20 Sunbird, P'Rumped
21 Parakeet, RoseRing	21 Pigeon, Green	21 Swallow, Cliff
*22 Partridge, Grey	22 Pipits(All)	22 Thrush, BlueRock
*23 Peacock	23 Roller, Indian	23 Thrush, BlueThroat
24 Pigeon, BlueRock	24 Shrike, Grey	24 Black Breasted Weaver
*25 Robin, Indian	25 Shrike, Com. Wood	25 Weavers, Streaked
*26 Robin, Magpie	26 Swallow, C'Martin	26 Woodpeck, Mahratta
*27 Redstart	27 Swallow, RedRump	27 Wryneck
*28 RosyPastor	28 Swallow, WireTail	
*29 Shrike, BayBacked	29 TreePie	
*30 Shrike, Rfs'Backed	30 Wagtail, Grey	
31 Sparrow, House	31 Wagtail, Pied	
*32 Starling	32 WhiteEye	
*33 StoneCurlew	33 Woodpecker, G'Back	
34 Sunbird, Purple		
35 Swallow, Common		
36 Swift, House	34 Kite, BlackWing	
37 Tailor, Bird	35 Vulture, Scavenger	
38 Wagtail, White		
39 Wagtail, Yellow		
40 Wagtail, Others		
*41 Warblers(All)		
*42 WrenWarblers, Ashy		
*43 WrenWarb, Indian		
*44 WrenWarb, Others		
*45 Weavers, Baya		

### BIRDS OF PREY

- 46 Kite, Pariah
- 47 Vulture, W'Backed

### BIRDS OF PREY

- 28 Buzzard, WhiteEyed
- 29 Eagle, Tawny
- 30 Harrier, Marsh
- 31 Harrier, Pale
- 32 Kestrel
- 33 Owl, Barn
- 34 Owl, Great horned
- 35 Owlet, Spotted
- 36 Shikra
- 37 Vulture, King
- 38 Vulture, LongBill

(Status of water birds  
contd. on next page.)

## STATUS REPORT OF ALL SPECIES OF BIRDS IDENTIFIED IN DELHI BIRD-COUNTS

COMMON SPECIES Protection needed for species marked (*)	UNCOMMON SPECIES Need habitat protection	RARE AND SPORADIC Need total protection
WATER BIRDS	WATER BIRDS	WATER BIRDS
*48 Cormorant	36 Sandpiper, Avocet	39 Bittern, Little
*49 Duck, Brahmini	37 Coot	40 Crane, Demoisele
*50 Duck, Pintail	38 Dabchick	41 Duck, Mallard
*51 Duck, Shoveller	39 Duck, Nakta	42 Duck, Teal, Cotton
*52 Duck, Spotbill	40 Duck, Pochard, Com.	43 Duck, Wigeon
*53 Duck, Teal, Common	41 Duck, Poch. R' Head	44 Gulls, Brownheaded
54 Egret, Cattle	42 Duck, Poch. Tufted	45 Herons, Grey
55 Egret, Little	43 Egret, Large	46 Ibis, White
56 Gull, Unidentified	44 Geese, Barheaded	47 Jacana, Bronzewing
*57 Heron, Night	45 Geese, Greylag	48 Kingfisher, L'blue
58 Heron, Pond	46 Gulls, Blackheaded	49 Kingfisher, S'bill
59 Lapwing, R' Wattled	47 Heron, Purple	50 Lapwing, W' Tailed
*60 Stilt, B' Winged	48 Jacana, Phes' tail	51 Pelican, Rosy
*61 Stint, Little	49 Kingfisher, Pied	52 Plovers, Kentish
*62 Stork, Painted	50 Kingfisher W' Breast	53 Plovers, L' Ringed
*63 Sandpiper, Others	51 Lapwing, Y' Wattled	54 Plover, Spurwing
	52 Moorhen, Indian	55 Pranticole, Sm. Ind.
	53 Sandpiper, Common	56 Sandpiper, Green
	54 Sandpiper, Spotted	57 Sandpiper, R' shank
	55 Terns (All)	58 Stork, Blackneck
	56 Waterhen, W' Breasted	



## APPENDIX 4

## DISTRIBUTION OF BIRD SPECIES UPDATED TO WINTER 1987

KEY : Numbers: + = 1-10

Sightings: \* = 1-2

++ = 11-50

\*\* = 3-5

+++ = &gt;50

\*\*\* = &gt;5

Areas # of Counts	D'Park (8)	ISBT (11)	J'Pana (5)	JNU (8)	K'Nala (5)	L'Gard (9)	R'Ghat (10)	RNRidge (5)	Zoo (10)
<hr/>									
BABBLER									
Common	+++**	+	+++**	+++***	+++**	+++**	++**	++**	+++***
Large Gray	+++**	++*	+++**	++*	+++**	+++***	++**	++**	+++***
Jungle	+++***	+++***	+++**	+++***	+++**	+++***	++**	+++**	+++***
Striated				++*			+		
Yel-eye	+			***	+				+
<hr/>									
BARBET									
Cop'smith	+	+		?+++**		+++**		+	+++**
Green		+				+	***	+	+
<hr/>									
BEE-EATER									
Bluetail							+		
Green	+++**	+++***		+++**	+++**	+++***	+++***	+++**	+++***
<hr/>									
BLUETHROAT									
					+	+	+++**		+
<hr/>									
BULBUL									
R'Vent	+++***	+++***	+++**	+++***	+++**	+++***	+++***	+++**	+++***
R'Whisker	+	+	***			+++***	+	+++**	+++***
W'Browed	?+*								
W'Cheek	+		***	+++***				+++**	+
<hr/>									
BUSHCHAT									
Collared	+				+	+	***	+	
Pied	***	+			***	+	+++***	++*	+
<hr/>									
CROW									
House	+++**	+++**	+++*	+++**	+++**	+++***	+++**	+++**	+++***
Jungle	***	+	+		+	+	+		+++***
CROWPHES.	+++***	***	+	***	***		***	+	***
<hr/>									
CUCKOO									
IndHawk			+	***			***	+	
PiedCrest	+		+	+++**	+			+	
Sirkeer								+	
<hr/>									
CUCKOO SHRIKE									
Large	+								
<hr/>									
DOVE									
L'Brown	+++***	+++***	+++**	+++***	+++**	+++***	+++***	+++**	+++***
Spotted					+			+	
R'Turtle	+					+		+	
Ringed	+++***	+++***	+++**	+++***	+++**	+++***	+++***	+++**	+++***
<hr/>									
DRONGO									
Black	+++**	+++**	+++**	+++**	***	+++**	+++***	***	+++***
<hr/>									
FLYCATCH									
GreyHead	+					+			
Fantail	+								
Redbreaste	+	+				+	+		
<hr/>									
HOOPOE									
	+++***	+++***	+++	+++***	+++**	+++***	+++***	+	+++***
<hr/>									
HORNBILL									
Grey	+	+				+		+	+
<hr/>									
IORA									
						+		+	+
<hr/>									
KOEL									
	+++*	+++**	+	+	+	+++***	+	+	+++*

(contd.)

## APPENDIX 4 (contd.)

## DISTRIBUTION OF BIRD SPECIES UPDATED TO WINTER 1987 (contd.)

Areas	D'Park	ISBT	J'Pana	JNU	K'Nala	L'Gard	R'Ghat	RNRidge	Zoo
# of Counts	(8)	(11)	(5)	(8)	(5)	(9)	(10)	(5)	(10)
LARK									
BushRedwing								+	
Crested		++		+	++		++	+	+
Others	+	++		+++	++	+	+++		
MINIVET									
Scarlet	+								
Small	+			+				+	
MARTIN									
DuskyCrag		++				++			+
Sand		+	+		+		+++	+	
MUNIA									
B'Head							++		
Red		+		+	++		++	++	++
Spotted							+	+	++
W'Back							+	+	
W'Throat	+	+	++	+++	++		+	++	+
MYNA									
Bank	++	+++	++	+++	++		+++	+	+
Brahmini	++	++	++	++	+++	++	++	+	+++
Common	+++	+++	+++	+++	+++	+++	++		+++
Pied	++	+++	++	++	+++	+++	+++	+	+++
NIGHTJAR				+					
NUTHATCH									
C'nutBelly								+	
ORIOLE									
Golden				+		+			++
PARAKEET									
Alexandrian					+	+	+		++
Bl'Headed		+			+	+	+	+	+
RoseRing	+++	+++	+++	+++	+++	+++	+++	+++	+++
PARTRIDGE									
Black	++	+		+++			+	+	
Grey	++	+	+	+++	+		+	++	+
PEAFOWL	+++		+++	+++	+			++	++
PIGEON									
BlueRock	+++	+++	+++	+++	+++	+++	+++	++	+++
Green	+	++					++	+	
PIPIT				++	+	++	++		+
QUAIL									
Bush				+			+		
ROBIN									
Indian	+++	+	++	+++	++	++	++	++	+++
Magpie	++	+			+	+++	+		++
REDSTART	++		++	++	+	++	++	++	++
ROCK CHAT									
Brown					+			+	
ROLLER									
Indian	+		+	+	+	+	++	+	
ROSYASTOR		+++		+++			++		
SHRIKE									
BayBacked	++	+	++	++	+	++	++	+	+
Grey	+		+	++	+		+	+	
RfsBacked	++	+	+	++	++	++	++	+	++
Com. Wood					+	+			

(contd.)



# APPENDIX 4 (contd.)

## DISTRIBUTION OF BIRD SPECIES UPDATED TO WINTER 1987 (contd.)

Areas # of Counts	D'Park (8)	ISBT (11)	J'Pana (5)	JNU (8)	K'Nala (5)	L'Gard (9)	R'Ghat (10)	RNRidge (5)	Zoo (10)
SPARROW									
House	++**	++++**		++++**	++++**	++++**		++**	++++**
STARLING		++**		++++**	++**		++++**	++**	++**
ST. CURLEW								++**	++**
SUNBIRD								++**	++++**
Purple	++**	++**	++**	++**	++**	++++**	++**	++**	++++**
F' Rumped						++**			
SWALLOW									
Cliff									
Common	++**	++++**	++**	++**	++++**	++**	++++**		++**
Redrump							++**		++**
Wiretail							++**		++**
SWIFT							++**		++**
House	++**			++++**	++**	++**	++**	++**	++**
Tailor Bird	++++**	++**	++**	++++**	++**	++++**	++**	++**	++**
THRUSH									
Blue Rock				++**				++**	++**
B' Throat							++**		++**
TREEPIE	++++**		++**	++**		++**		++**	
WAGTAIL								++**	
Grey	++**	++**	++**	++**	++**	++**	++**		
Pied	++**	++++**	++**	++**	++**	++**	++**		++**
White	++**	++++**		++**	++**	++**	++++**		++**
Yellow		++++**		++**		++**	++++**		++**
Others		++++**	++**		++++**		++++**		++**
WARBLERS							++++**		++**
Unidentifi	++++**	++++**	++++**	++++**	++++**	++++**	++++**		++++**
WREN-WARBLER									
Ashy	++++**	++**	++++**	++++**	++++**	++**	++++**	++**	++++**
Indian		++++**		++++**	++**	++**	++++**	++**	++++**
Others		++**		++++**	++**		++**	++**	++++**
WEAVER							++**	++**	++++**
Baya				++++**	++++**	++**	++**		++**
Streaked		++**					++**		++**
WHITEEYE	++**	++**		++**		++++**		++**	++**
WOODPECK									
G' Back	++**		++**			++++**			++**
Mahratta			++**			++**	++**	++**	++**
WRYNECK						++**	++**	++**	++**
*****BIRDS OF PREY*****									
BUZZARD									
White Eyed				++**					
HARRIERS									
Marsh									
Pale							++**		
KESTREL									
EAGLE								++**	
Tawny				++**					
KITES									
Bl. Wing				++++**	++**			++**	
Pariah	++++**	++++**	++**	++++**	++++**	++++**	++++**	++**	++++**

# APPENDIX 4 (contd.)

## DISTRIBUTION OF BIRD SPECIES UPDATED TO WINTER 1987 (contd.)

Areas	D'Park	ISBT	J'Pana	JNU	K'Nala	L'Gard	R'Ghat	RNRidge	Zoo
# of Counts	(8)	(11)	(5)	(8)	(5)	(9)	(10)	(5)	(10)
<hr/>									
OWL									
Barn				++					
Gr. Horned				+++					
<hr/>									
OWLET									
Spotted	++			++		++			
SHIKRA								++	
<hr/>									
VULTURES									
King								+++	
L'Bill						++	++		++
Scavenger		+++		+++	++	+++	+++	++	+++
W.B. Bengal		+++	++	+++	+++	+++	+++		+++
<hr/>									
***** WATER BIRDS *****									
<hr/>									
Avocet		+++					++		
<hr/>									
BITTERN									
Little							++		
COOT		+++					+++		
CORMORANT		+++		++		++	+++		+++
<hr/>									
CRANES									
Demoiselle									+++
DABCHICK	++	++					+++		++
<hr/>									
DUCK									
Brahmini		+++							+++
Mallard									+++
Nakta							++		+++
Pintail		+++					+++		+++
Poch., Com.							+++		
Redhead		++					+++		
Tufted							+++		
Shoveller		+++				++	+++		+++
Spotbill		+++					++		+++
Teal, Com.		+++					+++		+++
Cotton		++							++
Wigeon							++		
<hr/>									
EGRET									
Cattle	++	+++		++	++	+++	+++	++	+++
Large		+++					+++		++
Little	++	+++				++	+++	++	+++
<hr/>									
GOOSE									
Barhead		++							++
Greylag							+++		++
<hr/>									
GULL									
BlackHead							+++		
BrownHead							++		
Unidentified		+++							

(contd.)



## APPENDIX 4 (contd.)

## DISTRIBUTION OF BIRD SPECIES UPDATED TO WINTER 1987 (contd.)

Areas # of Counts	D'Park (8)	ISBT (11)	J'Pana (5)	JNU (8)	K'Nala (5)	L'Gard (9)	R'Ghat (10)	RNRidge (5)	Zoo (10)
HERON									
Grey		+++					++		
Night									++++
Pond	++	++++		++++	+++	++	++++	++	++++
Purple		++					++++		
JACANA									
BronWing							++		
PheTail		++		++			++		
KINGFISHER									
LitBlue			++	++		++	++		+++
Pied		++		++			++++		++
Storkbill						++			
W'Breast	+++	+++		++++	+++	+++	++++		
LAPWING									
R'Wattle		++++	+++	++++	++++	++++	++++	++	++++
Yellow "					+++		++		
W'Tailed							++		
MOORHEN									
Indian				++					++++
PELICAN									
Rosy									+++
Plovers									
Kentish		++					++		
Lit.Ring		++					+++		
Spurwinged		+++							
FRANTICOLE									
SmallInd.							++		
SANDPIPER									
Common	++	++++		++	+++		++++		++
Green		++					+++		++
Redshank		++					+++		
Spotted		++					++++		
Others		+++					++++		
STILT									
B'Wing	+++	++++			++				
STINT									
Little		++++					++		
STORK									
B'Neck							++		++
Painted		+++		+++			+++		++++
TERN		+++		++					++
WATERHEN									
W'Breast		++		++	+++	+++			++++

(x)

## APPENDIX 5

Scientific names of popular bird names used in the text of the bird count analysis  
 The common names are arranged alphabetically under three headings; (1) Land birds,  
 (2) Birds of Prey, and (3) Water Birds.  
 Scientific names have been taken from Salim Ali's 'Handbook of Indian Birds'

NAMES USED IN TEXT	SCIENTIFIC NAMES	:	NAMES USED IN TEXT	SCIENTIFIC NAMES
LAND BIRDS		:	LAND BIRDS (Contd.)	
1 Babbler, Common	<i>Turdoides caudatus</i>	:	54 Nightjar	<i>Caprimulgus asiaticus</i>
2 Babbler, L'Grey	<i>Turdoides malcolmi</i>	:	55 NuthatchC'nutBelly	<i>Sitta castanea</i>
3 Babbler, Jungle	<i>Turdoides striatus</i>	:	56 Oriole, Golden	<i>Oriolus oriolus</i>
4 Babbler, Striated	<i>Turdoides earlei</i>	:	57 Parakeet, Alexand.	<i>Psittacula eupatria</i>
5 Babbler, Yel'eyed	<i>Chrysomma sinense</i>	:	58 Parakeet, Bl'Head	<i>Psittacula cyanocephala</i>
6 Barbet, CrimsonBr'	<i>Megalaima haemacephala</i>	:	59 Parakeet, RoseRing	<i>Psittacula krameri</i>
7 Barbet, L'Green	<i>Megalaima zeylanica</i>	:	60 Partridge, Black	<i>Francolinus francolinus</i>
8 BeeEater, Bluetail	<i>Merops philippinus</i>	:	61 Partridge, Grey	<i>Francolinus pondicerianus</i>
9 BeeEater, Green	<i>Merops orientalis</i>	:	62 Peafowl	<i>Pavo cristatus</i>
10 BlueThroat	<i>Erithacus svecicus</i>	:	63 Pigeon, BlueRock	<i>Columba livia</i>
11 Bulbul, Redvented	<i>Pycnonotus cafer</i>	:	64 Pigeon, Green	<i>Treron phoenicoptera</i>
12 Bulbul, R'Whisker	<i>Pycnonotus jocosus</i>	:	65 Pipits(All)	Unspecified
13 Bulbul, W'Browed	<i>Pycnonotus luteolus</i>	:	66 Quail, Bush	? <i>Perticula asiatica</i>
14 Bulbul, W'Cheek	<i>Pycnonotus leucogenys</i>	:	67 Robin, Indian	<i>Saxicoloides fulicata</i>
15 Bushchat, Collared	<i>Saxicola torquata</i>	:	68 Robin, Magpie	<i>Copsychus saularis</i>
16 Bushchat, Pied	<i>Saxicola caprata</i>	:	69 Redstart	<i>Phoenicurus ochruros</i>
17 Chat, BrownRock	<i>Cercomela fusca</i>	:	70 Roller, Indian	<i>Coracias benghalensis</i>
18 Crow, House	<i>Corvus splendens</i>	:	71 RosyPastor	<i>Sturnus roseus</i>
19 Crow, Jungle	<i>Corvus macrorhynchos</i>	:	72 Shrike, BayBacked	<i>Lanius vitatus</i>
20 Crowspheasant	<i>Centropus sinensis</i>	:	73 Shrike, Grey	<i>Lanius excubitor</i>
21 Cuckoo, IndHawk	<i>Cuculus varius</i>	:	74 Shrike, Rfs'Backed	<i>Lanius schach</i>
22 Cuckoo, PiedCrest	<i>Clamator jacobinus</i>	:	75 Shrike, Com.Wood	<i>Tephrodornis pondicerianus</i>
23 Cuckoo, Plaintive	<i>Cacomantis merulinus</i>	:	76 Sparrow, House	<i>Passer domesticus</i>
24 Cuckoo, Sirkeer	<i>Taccocua lechenaultii</i>	:	77 Starling	<i>Sturnus vulgaris</i>
25 CuckooShrikeLarge	<i>Coracina novaehollandiae</i>	:	78 StoneCurlew	<i>Burhinus oedicnemus</i>
26 Dove, Lit. Brown	<i>Streptopelia senegalensis</i>	:	79 Sunbird, Purple	<i>Nectarinia asiatica</i>
27 Dove, R'Turtle	<i>Streptopelia tranquebarica</i>	:	80 Sunbird, P'Rumped	<i>Nectarinia zeylonica</i>
28 Dove, Ringed	<i>Streptopelia decaocto</i>	:	81 Swallow, Cliff	<i>Hirundo fluviicola</i>
29 Dove, Spotted	<i>Streptopelia chinensis</i>	:	82 Swallow, Common	<i>Hirundo rustica</i>
30 Drongo, Black	<i>Dicrurus adsimilis</i>	:	83 Swallow, RedRump	<i>Hirundo daurica</i>
31 Flycatch, Greyhead	<i>Culicicapa ceylonensis</i>	:	84 Swallow, WireTail	<i>Hirundo smithii</i>
32 Flycatch, Fantail	<i>Rhipidura albicollis</i>	:	85 Swift, House	<i>Apus affinis</i>
33 Flycatch, R'Breast	<i>Muscicapa parva</i>	:	86 Tailor Bird	<i>Orthotomus sutorius</i>
34 Hoopoe	<i>Upupa epops</i>	:	87 Thrush, BlueRock	<i>Monticola solitarius</i>
35 Hornbill, Grey	<i>Tockus birostris</i>	:	88 Thrush, BlackThroat	<i>Trudus ruficollis</i>
36 Iora	<i>Aegithina tiphia</i>	:	89 TreePie	<i>Dendrocitta vagabunda</i>
37 Koel	<i>Eudynamys scolopacea</i>	:	90 Wagtail, Grey	<i>Montacilla caspica</i>
38 Lark, R'WingBush	<i>Mirafra erythroptera</i>	:	91 Wagtail, Pied	<i>Montacilla maderaspatensis</i>
39 Lark, Crested	<i>Galerida cristata</i>	:	92 Wagtail, White	<i>Montacilla alba</i>
40 Lark, Others	Unspecified	:	93 Wagtail, Yellow	<i>Montacilla flava</i>
41 Martin, Dusky Crag	<i>Hirundo concolor/is</i>	:	94 Wagtail, Others	Unspecified
42 Martin, Sand	? <i>Riparia riparia</i>	:	95 Warblers(All)	Unspecified
43 Minivet, Scarlet	<i>Pericrocotus flammeus</i>	:	96 WrenWarblers, Ashy	<i>Prinia socialis</i>
44 Minivet, Small	<i>Pericrocotus sinuatus</i>	:	97 WrenWarb, Indian	<i>Prinia subflava</i>
45 Munia, Blackheaded	<i>Lonchura malacca</i>	:	98 WrenWarb, Others	Unspecified

(contd.)



Scientific names of popular bird names used in the text of the bird count analysis (contd.)

NAMES USED IN TEXT	SCIENTIFIC NAMES	NAMES USED IN TEXT	SCIENTIFIC NAMES
Land Birds (contd.)		Land Birds (contd.)	
46 Munia, Red	<i>Estrilda amandava</i>	99 Weavers, Baya	<i>Ploceus philippinus</i>
47 Munia, Spotted	<i>Lonchura punctulata</i>	100 Weavers, B' Breast	<i>Ploceus benghalensis</i>
48 Munia, W' Backed	<i>Lonchura striata</i>	101 Weavers, Streaked	<i>Ploceus manyar</i>
49 Munia, W' Throated	<i>Lonchura malabarica</i>	102 White Eye	<i>Zosterops palpebrosa</i>
50 Myna, Bank	<i>Acridotheres ginginianus</i>	103 Woodpecker, G' Back	<i>Dinopium benghalense</i>
51 Myna, Brahmini	<i>Sturnus pagodarum</i>	104 Woodpeck, Mahratta	<i>Picoides mahrattensis</i>
52 Myna, Common	<i>Acridotheres tristis</i>	105 Wryneck	<i>Gynx torquilla</i>
53 Myna, Pied	<i>Sturnus contra</i>		
BIRDS OF PREY		BIRDS OF PREY (Contd.)	
106 Buzzard, White Eyed	<i>Butastur teesa</i>	114 Owl, Great horned	<i>Bubo bubo</i>
107 Eagle, Tawny	<i>Aquila rapax</i>	115 Owl, Spotted	<i>Athene brama</i>
108 Harrier, Marsh	<i>Circus aeruginosus</i>	116 Shikra	<i>Accipiter badius</i>
109 Harrier, Pale	<i>Circus macrourus</i>	117 Vulture, King	<i>Torgos calvus</i>
110 Kestrel	<i>Falco tinnunculus</i>	118 Vulture, Long Bill	<i>Gyps indicus</i>
111 Kite, Black Wing	<i>Elanus caeruleus</i>	119 Vulture, Scavenger	<i>Neophron percnopterus</i>
112 Kite, Pariah	<i>Milvus migrans</i>	120 Vulture, W' Breasted	<i>Gyps bengalensis</i>
113 Owl, Barn	<i>Tyto alba</i>		
WATER BIRDS		WATER BIRDS (Contd.)	
121 Avocet	<i>Recurvirostra avosetta</i>	150 Heron, Purple	<i>Ardea purpurea</i>
122 Bittern, Little	<i>Butorides striatus</i>	151 Ibis, White	<i>Threskairnis melanocephala</i>
123 Coot	<i>Fulica atra</i>	152 Jacana, Bronze Wing	<i>Metopidius indicus</i>
124 Cormorant	<i>Phalacrocorax niger</i>	153 Jacana, Phe's tail	<i>Hydrophasianus chirurgus</i>
125 Crane, Demoiselle	<i>Anthropoides virgo</i>	154 Kingfisher, Lit. blue	<i>Alcedo atthis</i>
126 Dabchick	<i>Podiceps ruficollis</i>	155 Kingfisher, Pied	<i>Ceryle rudis</i>
127 Duck, Brahmini	<i>Tadorna ferruginea</i>	156 Kingfisher, S' bill	<i>Pelargopsis capensis</i>
128 Duck, Mallard	<i>Anas platyrhynchos</i>	157 Kingfisher W, Breast	<i>Halcyon swynnensis</i>
129 Duck, Nakta	<i>Sarkidiornis melanotos</i>	158 Lapwing, R' Wattled	<i>Vanellus indicus</i>
130 Duck, Pintail	<i>Anas acuta</i>	159 Lapwing, Y' Wattled	<i>Vanellus malabaricus</i>
131 Duck, Pochard, Com.	<i>Aythya ferina</i>	160 Lapwing, W' Tailed	<i>Vanellus leucurus</i>
132 Duck, Poch. R' Head	<i>Netta rufina</i>	161 Moorhen, Indian	<i>Gallinula chloropus</i>
133 Duck, Poch. Tufted	<i>Aythya fuligula</i>	162 Pelican, Rosy	<i>Pelecanus onocrotalus</i>
134 Duck, Shoveller	<i>Anas clypeata</i>	163 Plovers, Kentish	<i>Charadrius alexandrinus</i>
135 Duck, Spotbill	<i>Anas poecilorhyncha</i>	164 Plovers, Lit. Ring	<i>Charadrius dubius</i>
136 Duck, Teal, Common	<i>Anas crecca</i>	165 Plover, Spurwing	<i>Vanellus spinosus</i>
137 Duck, Teal, Cotton	<i>Nettapus coromandelianus</i>	166 Pranticole, Sm. Ind.	<i>Glareola lactea</i>
138 Duck, Wigeon	<i>Anas penelope</i>	167 Sandpiper, Common	<i>Tringa hypoleucos</i>
139 Egret, Cattle	<i>Bubulcus ibis</i>	168 Sandpiper, Green	<i>Tringa ochropus</i>
140 Egret, Large	<i>Egretta alba</i>	169 Sandpiper, R' shank	<i>Tringa totanus</i>
141 Egret, Little	<i>Egretta garzetta</i>	170 Sandpiper, Spotted	<i>Tringa glareola</i>
142 Geese, Barheaded	<i>Anser indicus</i>	171 Sandpiper, Others	Unspecified
143 Geese, Greylag	<i>Anser anser</i>	172 Stilt, B' Winged	<i>Himantopus himantopus</i>
144 Gull, Blackheaded	<i>Larus ridibundus</i>	173 Stint, Little	<i>Calidris minutus</i>
145 Gull, Brownheaded	<i>Larus brunnicephalus</i>	174 Stork, Blackneck	<i>Xenorhynchus asiaticus</i>
146 Gull, Unidentified	Unspecified	175 Stork, Painted	<i>Ibis leucocephalus</i>
147 Herons, Grey	<i>Ardea cinerea</i>	176 Terns (All)	Unspecified
148 Heron, Night	<i>Nycticorax nycticorax</i>	177 Waterhen, W' Breasted	<i>Amaurornis phoenicurus</i>
149 Heron, Pond	<i>Ardeola grayii</i>		